PAINT and VARNISH Production

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

PAINT MAKERS' Specialties

ASKA

ADVANCE ANTI-SKINNING AGENT

effectively eliminates formation of skin in packaged paints — now has a still milder odor.

APA

ADVANCE PUFFING AGENT

increases viscosity rapidly and permanently in paints and varnishes. With APA #2 forms strong bodying agent for alkyd flats.

AAFA

ADVANCE ANTI-FLOODING AGENT

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AALA

ADVANCE ANTI-LIVERING AGENT

useful in red lead - oil dispersions to insure against livering, or to recover spoiled batches.

PLASTOFLEX 520...

phthalate ester type plasticiser
very useful in lacquer formulations.

Try and compare. Ask for samples and data.

ADVANCE SOLVENTS & CHEMICAL CORP.
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AUGUST 1953

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Chemistry's Wonder Alkyd for Wall Enamels

A REVOLUTIONARY DEVELOPMENT IN WALL ENAMEL FORMULATION!

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Only WALLKYD-base wall enamels offer you *all* these advantages:

They go on easily. Anyone can paint like a "pro" and turn out a job that's smoother, freer from brush and roller marks, laps, runs, sags.

They dry in a jiffy. You can put furniture and drapes back in the evening when you paint in the morning. And even if you soil the surface the next day, you'll find it hard enough to wash without marring. There's no lengthy "tender" period.

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They "cover" better. Solvent-thinned WALLKYD-base wall enamels actually contain more pigment and color (more paint) per gallon, which accounts for their greater hiding power per coat.

They're tops in beauty. You can't beat the delicate pastels, vibrant deep tones, longer life, greater resistance to scratching, marring and chipping characteristic of these finishes.

They're free from pungent "wet paint" fumes that smell bad, burn the eyes and sting the nose and throat.

Whether you employ a painter or "do it yourself", you'll want to get the unusual combination of features available only in a WALLKYD-base wall enamel. Write us for a list of the paint manufacturers now formulating with WALLKYD.

Demand a Brand made with WALLKYD

To get full advantage of the many improved properties imparted by WALLKYD, today's finest alkyd for flat wall enamels, make sure the manufacturer guarantees a minimum of 55% WALLKYD in his "vehicle solids".

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U. S. NEWS & WORLD REPORT	Sept. 18th... Oct. 9th
FORTUNE	Sept.... Oct.
BUSINESS WEEK	Sept. 5th... Sept. 26th

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For full information on WALLKYD and the WALLKYD advertising program, write...

REICHHOLD CHEMICALS, INC.
630 Fifth Avenue, New York 20, N. Y.

The paint thinner with no more odor than pure water!

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Odorless

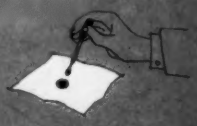
—It looked as though no one would ever come up with a thinner you couldn't smell. But this is it—Shell Sol 72. You cannot detect an odor of any kind. It's the completely "smell proof" thinner for use in finishes for homes, hospitals, restaurants and hotels.

Holds wet edge longer

You get bonus qualities with Shell Sol 72. Your finishes will hold a wet edge longer . . . users can be less fussy about brushing and lap marks.

TEST SHELL SOL 72 YOURSELF!

1. Put two drops of water on a clean cloth.



2. Put two drops of Shell Sol 72 on another.

3. Compare! Shell Sol 72 has no more odor than water.

We will send you a one-gallon sample of Shell Sol 72 for your own tests. Please request it on your company letterhead.

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VOL. 43 AUGUST, 1953 NO. 8

NEXT ISSUE

"Aerosol Coating Composition" will be the subject of one of the feature articles for our September number. Some of the factors that influence the formulation of aerosol coating compositions will be discussed in this article. These include effect of propellent, compatibility of paint base with propellent, and pressure and consistency relationships.

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WHETHER YOU USE an aliphatic or aromatic diluent, *you can use more diluent* when the active solvent in your lacquer formulations is a ketone.

A glance at the chart will show how ketones give you a better break. Here are six typical furniture-type lacquers with the same solids content and the same viscosity. They differ only in the active solvent employed. Three contain an aliphatic diluent. Three contain an aromatic. Take a look at the diluent content!

The ketone-aliphatic combination holds 45% diluent, and the ketone-aromatic—55% diluent. *The ketone-based lacquers show the highest diluent content with both types of diluent.*

There are other important advantages to be had with ketones, too. You can get higher solids concentration in a practical spraying viscosity range. Or you may use greater proportions of the high viscosity nitrocottons to obtain lacquers with improved toughness and durability.

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Editorial Comment

From the Bottom Up

IN A very enlightening address before the Detroit Meeting of Committee D-1 of the American Society for Testing Materials, Newell P. Beckwith of the Rinshed-Mason Company discussed the technical man's responsibilities from the production man's viewpoint.

Four aspects were discussed, namely Personnel Relations, Developing a High Standard of Scientific Attitude, Principles of Formulation, and Advancing the Profession.

Mr. Beckwith's remarks concerning Personnel Relations were indeed interesting and we quote:—

"Perhaps the most serious failing of young technical men is a lack of understanding and feeling for other people particularly those in supervision and labor. The high-handed, superior attitude so many young men assume to cover personal uncertainty is most distasteful to production men. This attitude is partly the result of incomplete education. Chemists may be fairly thoroughly grounded in inanimate chemical and physical operations but at best are sketchily introduced to the science of dealing with people, and must be taught how to get along with people.

"The humble and understanding treatment of a foreman is essential to getting full cooperation for a special production test, bearing in mind that the foreman has a quota of production to accomplish regardless of tests.

"Also the technical man must learn to go 'through channels' in accomplishing operations affecting production. Blind and indifferent disregard by the technicians for the plans and authority of supervision management may interfere with production and certainly breeds irritation and resistance in the people by-passed.

"In the field of labor relations, the technical man must realize that he has a responsibility even though he may not directly supervise the work of anyone. Some of the toughest labor problems in our paint plants are caused by paint chemists violating the company labor contracts. This is often the fault of the people charged with labor relations in that they do not adequately inform the technicians of contract provisions. Nevertheless, it is the technicians responsibility to be familiar with the provisions of the labor contract and not take unwitting actions which will be the subject of grievances."

We share Mr. Beckwith's views on the subject of personnel and labor relations and concur with his recommendation that the recent graduate needs guidance and education, especially in the handling of labor.

In this connection, an educational program under the supervision of both labor and management will go a long way in clearing up some of the misunderstandings that exist between the technicians and the production personnel. Also, maintaining active safety, sanitation, and recreation programs in which both the technicians and production people participate will help materially to eliminate any difficulties which may develop between these two groups.

It is true that the technical man must learn to go "through the channels". Put him "through the channels" as soon as he is hired.

As a part of his basic training with the firm, the recent graduate chemist should spend from 6-8 weeks performing production duties. He will then become familiar with all the aspects and problems of paint manufacturing. His chores may include preparing a batch of paint, operating various mixing and grinding equipment (under the guidance of a skilled worker), filling, running control tests, cooking varnish, etc. After this "in-the-plant" training, he is ready for the laboratory and is in a better position to successfully solve any production problem in which the laboratory is involved.

Of course, it is realized that the success of this basic training lies in the complete cooperation of the skilled labor in the plant. The young graduate will ask a lot of questions, and it will be up to the skilled operator to answer him and show him how. Some firms have run into trouble with organized labor groups because of their attitude toward active production work by non-organized technical personnel. In such instances, it is believed that an amicable solution can be worked out between organized labor and management on "in-the-plant" training, and we feel that participation of labor in such a program will undoubtedly help matters.

The inexperienced chemist needs guidance and training, and it is up to his superiors to help him; for nothing but time can provide him with experience.

how?

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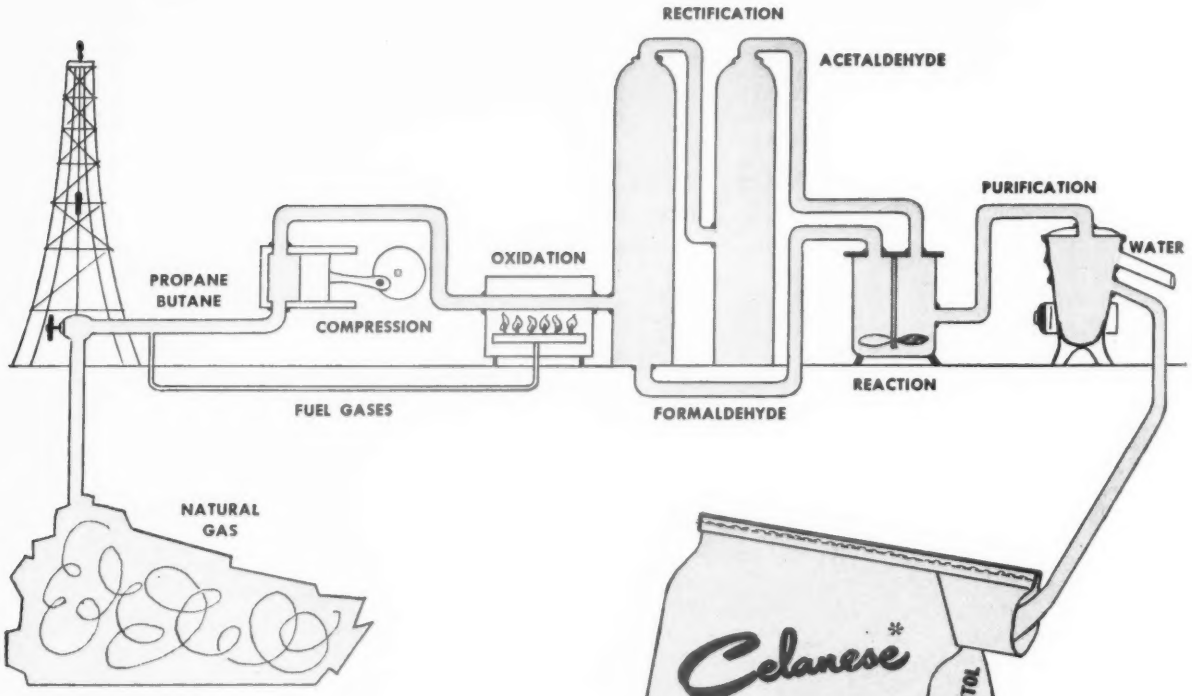

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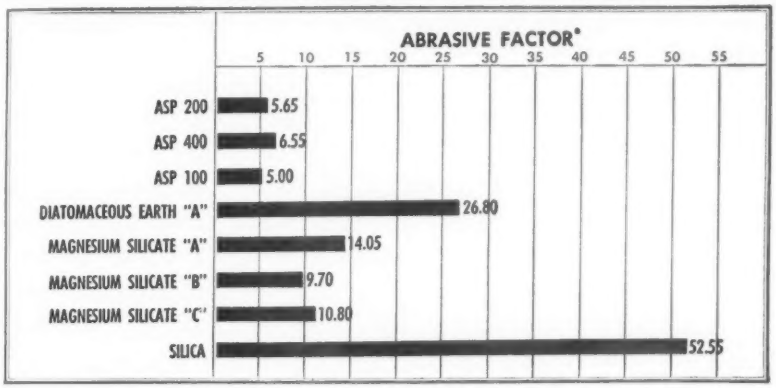
INERT PIGMENTS THAT IMPROVE YOUR PRODUCT

ASP ALUMINUM SILICATE PIGMENTS

PUBLISHED BY EDGAR BROTHERS COMPANY METUCHEN, NEW JERSEY

TESTS PROVE SUBSTANTIAL SAVINGS POSSIBLE FOR PAINT MANUFACTURERS



*Loss in milligrams in excess of 4.45 mg Machine Constant.

Results of Abrasive Tests show Average Abrasive Factor of Edgar ASPs to be 5.73. Other siliceous inerts tested range from 9.70 to 52.55.

How These Abrasive Tests Were Conducted At Edgar Laboratory

These exacting abrasion tests were conducted in the Edgar Brothers Laboratory in McIntyre, Georgia.

For this purpose a Gardner Washability Machine was used on representative samples of each siliceous inert tested. A sponge rubber pad, faced with billiard felt, was substituted for the usual brush.

The exact weights of copper strips, 4" x 18", were individually determined, and, one-by-one, then subjected to the test. A 20% slurry was slowly dropped on the copper while the weighted felt covered rubber sponge was pulled back and forth over the strip and through the slurry.

After 2,500 cycles, or 5,000 strokes, the copper was removed, carefully washed, dried and reweighed. The copper was then replaced in the abrader and 2,500 more cycles given it.

The first 2,500 cycles were applied solely to remove all traces of the oxide coating on each strip. Only the loss in milligrams resulting from the second cycle was taken as the Abrasive Factor.

To establish a "machine constant," tests were run using distilled water only as the abrasive medium. The Abrasive Factor of water in all cases was subtracted from the Factor found with the slurry.

EASY TO TEST

It is easy to test the qualities of Edgar ASPs right in your own formulas. All you need do is use the coupon to order your free sample drum of the ASP best suited to your requirements.

Competitive Product Tests Show Edgar ASPs Lowest In Abrasion

The continuing Testing and Research Program at the Edgar Brothers Laboratory has, once again, produced evidence that Edgar ASPs can reduce paint manufacturing and machine maintenance costs.

Testing the relative abrasive qualities of Edgar ASPs and competitive siliceous inerts, has shed new light on this important subject.

These tests furnish proof that Edgar ASPs are relatively non-abrasive and can be safely ground on a three roll mill, even with high pigment loading, without risk of serious abrasive action on the rolls.

It was found that all grades of Edgar ASPs are considerably less abrasive than other siliceous inerts tested. For example: the *average* Abrasive Factor of the four ASPs tested was 5.73 plus, while the Abrasive Factors of the other siliceous inerts tested ranged from a low of 9.70 to a high of 52.55 (see bar chart).

The low Abrasive Factor of Edgar ASPs is an assurance of reduction in mill wear when paints are formulated with these finer inerts.

Increased speed of production, decreased machine maintenance costs add up to real dollar economy for Paint Manufacturers.

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medium

AZO acicular lead-free zinc oxide is a superior pigment available in a wide range of oil absorptions

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A medium oil absorption Acicular Zinc Oxide imparting exceptional weathering qualities to exterior paints

AZO ZZZ-33

A definitely Acicular type with a lower oil absorption, but chemically identical with AZO ZZZ-11 and AZO ZZZ-22

low

The extra durability, the finer weathering qualities that Acicular Zinc Oxide gives to paint can be obtained with AZO Acicular Zinc Oxides available in a wide range of oil absorptions to meet your requirements

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AZO

the chemist's page

Nuact Paste stabilizes drying

Nuact Paste and its advantages:

Nuact Paste is the special Nuodex "feeder" drier for paint that stabilizes drying time regardless of aging. In contrast to litharge which is sometimes used for the same purpose, Nuact Paste disperses readily and performs uniformly in every batch. It becomes active slowly and *in controlled amounts* over an extended period of time without hastening initial dry or altering final film qualities.

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Where Nuact Paste works:

Use Nuact Paste in any paint or enamel where the pigment is suspected of being adsorbent of driers, particularly carbon blacks, blues, greens, reds and titanium whites. Over 50 million gallons of paint have been successfully insured against loss of dry with Nuact Paste by hundreds of paint manufacturers. Add Nuact Paste with confidence, in every product, regardless of composition, where loss of dry occurs.

Try Nuact Paste yourself:

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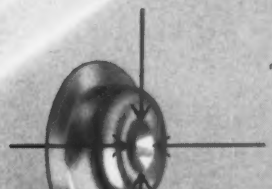

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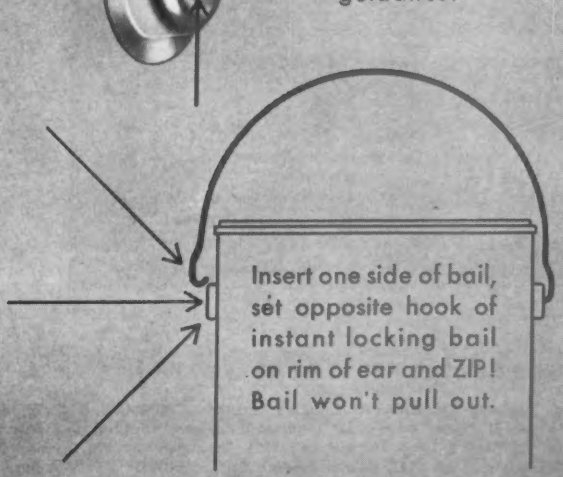

Insert one side of bail, set opposite hook of instant locking bail on rim of ear and ZIP! Bail won't pull out.

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—after more than 3 years rough service

The entire floating roof of this oil tank is protected with a coating based on VINYLITE Brand Resins. Despite rough service, direct sun, and water accumulation in low spots, the coater reports,

"the deck on the first tank which is now over three years old looks just as good as the day they [our men] walked away from it!"

Compare this performance. The small photo shows a tank side finished at the same time with an ordinary paint. Failure and rust stains are very evident. Yet, note the top rim, finished with a coating based on VINYLITE Resins, is in excellent condition.

It pays to formulate with VINYLITE Resins. Your coatings will look better and last longer—on metal, masonry or other surfaces. Properly applied, they won't crack, chip, peel or fade. They will withstand rough treatment, chemicals, salt water, weather extremes, industrial gases. Coatings based on VINYLITE Resins always give greater satisfaction—and that's what makes your customers come back for more.

For a copy of our free booklets, "BAKELITE and VINYLITE Resins for the Chemical Industry," and "BAKELITE and VINYLITE Resins for the Petroleum Industry," write Dept. RX-75

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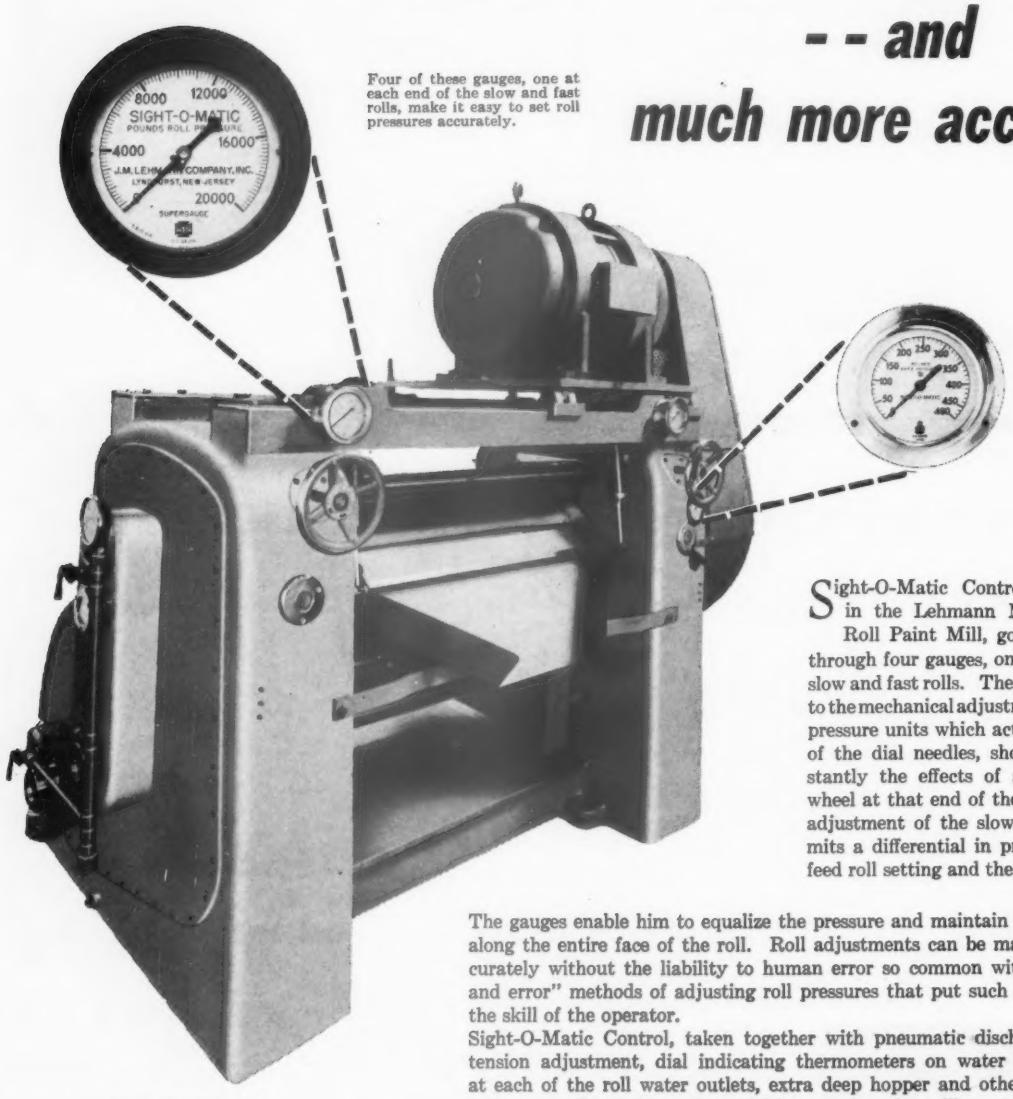

Four of these gauges, one at each end of the slow and fast rolls, make it easy to set roll pressures accurately.

This gauge shows pressures applied to the take-off knife. It is part of the pneumatic discharge control that assures optimum pressure for efficient take-off.

Sight-O-Matic Control, as incorporated in the Lehmann Model 631-V Three Roll Paint Mill, governs roll pressures through four gauges, one at each end of the slow and fast rolls. These gauges, connected to the mechanical adjustment system through pressure units which actuate the movement of the dial needles, show the operator instantly the effects of adjusting the hand wheel at that end of the roll. Independent adjustment of the slow and fast rolls permits a differential in pressure between the feed roll setting and the take-off roll setting

The gauges enable him to equalize the pressure and maintain uniformity of grind along the entire face of the roll. Roll adjustments can be made quickly and accurately without the liability to human error so common with the slower "trial and error" methods of adjusting roll pressures that put such a high premium on the skill of the operator.

Sight-O-Matic Control, taken together with pneumatic discharge control, drive tension adjustment, dial indicating thermometers on water inlet manifold and at each of the roll water outlets, extra deep hopper and other roller mill refinements, contributes to a substantial increase in paint mill capacity.

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Diisobutyl ketone is the best all-round dispersant for organosol-type resins based on VINYLITE resin VYNV. It is possible to prepare films having less than 15 per cent plasticizer when diisobutyl ketone is used.

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For further information on diisobutyl ketone, concerning properties, prices, delivery, and uses, call or write for your copy of our technical information sheet (F-6934). We have offices in principal cities. In Canada: Carbide and Carbon Chemicals, Limited, Toronto.

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CSC AMINES

Furfurylamine (2-furanmethylamine)
$C_4H_3OCH_2NH_2$

Highly reactive heterocylic compound. Undergoes reactions typical of primary amines. Properties suggest application in the synthesis of dyestuffs, resins, pharmaceuticals, rubber, and petroleum additives.

Sp. Gr. at 25/4°C (pure material) 1.0502
Boiling Pt. at 760 mm (pure material) ..... 145-146°C
Melting Pt. .....–70°C approx.

2-Hydroxyethyltrimethylammonium bicarbonate (45% aqueous solution)
$(CH_3)_3N(HCO_3)CH_2CH_2OH$

This quaternary ammonium salt appears to offer many possibilities as a latent alkaline catalyst for resins and other processes. Also as an intermediate for preparing choline salts.

Freezing Pt. (45% solution) .....–21.3°C
Refractive Index n_D at 25°C (45% solution).....1.3967

CSC ALKANOLAMINES

These compounds readily undergo a wide variety of reactions. They form substituted amides with acids, esters, anhydrides and acyl halides. They also react with other compounds including alkyl halides, aldehydes, ketones, and carbon disulfide.

The alkanolamines provide raw materials for synthesis; emulsifying agents in forms of their soaps, raw materials for textile specialties, drying oils, and synthetic resins.

2-Amino-1-butanol $CH_3CH_2CHNH_2CH_2OH$
Sp. Gr. at 20/20°C 0.944
Boiling Pt. at 760 mm .....178°C
Melting Pt. .....–2°C

2-Amino-2-ethyl-1,3-propanediol
$CH_2OHC(C_2H_5)(NH_2)CH_2OH$
Sp. Gr. at 20/20°C..... 1.099
Boiling Pt. at 10 mm.....152-153°C
Melting Pt.....37.5-38.5°C

Tris(hydroxymethyl)aminomethane
$(CH_2OH)_3CNH_2$
Boiling Pt. at 10 mm.....219-220°C
Melting Pt.....171-172°C

N-Methylglucamine
$CH_3{\cdot}NH{\cdot}CH_2(CHOH)_4{\cdot}CH_2OH$

This is a polyhydroxyamine with properties that suggest application in the synthesis of surface-active agents, pharmaceuticals, dyeing assistants and other fields. It undergoes many reactions typical of secondary amines. It is soluble in water, and pH of a 1% aqueous solution at 25°C is 10.5.

Melting Pt.....128-129°C

CSC AMIDES

Dimethylformamide $H{\cdot}CO{\cdot}N(CH_3)_2$

A powerful solvent for a wide variety of materials including nitrocellulose, cellulose acetate, cellulose triacetate and vinylite resins. It exhibits selective solvent properties—its low volatility and stability to heat facilitate easy, low-loss recovery. It possesses outstanding solvent properties for many common gases.

Sp. Gr. at 25/4°C 0.9445
Boiling Pt. at 760 mm .....153°C
Melting Pt.....–61.0°C

CSC CHLORONITRO-PARAFFINS

This versatile group comprises stable liquids miscible with most organic solvents, including the lower alcohols, glycols, esters, ethers, petroleum hydrocarbons, mineral oils, and vegetable oils. The chloronitroparaffins are excellent as solvents for fats and waxes and as anti-gelling agents in certain types of rubber cement.

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Here are 22 CSC new-horizon chemicals which might help improve your products or processes and your market opportunities. They bear evaluating. Our Market Development team is prepared to work with you in developing these for your profitable use. Write today on company letterhead for technical data sheets and samples.

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COMMERCIAL SOLVENTS
CORPORATION
260 MADISON AVE., NEW YORK 16, N. Y.

One of this group 1,1-dichloro-1-nitroethane is a powerful fumigant for insect pests attacking stored fur, tobacco, and a variety of foodstuffs.

1-Chloro-1-nitropropane $CH_3CH_2CHClNO_2$
Sp. Gr. at 20/20°C..... 1.209
Distillation Range (90%).....139.5-143.3°C

2-Chloro-2-nitropropane$CH_3CClNO_2CH_3$
Sp. Gr. at 20/20°C 1.193
Distillation Range (90%) 129.0-132.3

1,1-Dichloro-1-nitroethane $CH_3CCl_2NO_2$
Sp. Gr. at 20/20°C 1.405
Distillation Range (90%).....122.0-125.0°C

1,1-Dichloro-1-nitropropane
$CH_3CH_2CCl_2NO_2$
Sp. Gr. at 20/20°C 1.314
Distillation Range (90%).... 141.0-143.6°C

CSC NITROHYDROXY COMPOUNDS

Of particular interest in chemical synthesis. One compound of this group has shown usefulness as a heat sensitizer for rubber latex; another as a high-boiling solvent for zein, cellulose acetate, and oil soluble dyes. They are also useful as mild oxidizing agents.

2-Nitro-1-butanol $CH_3CH_2CHNO_2CH_2OH$
Boiling Pt. at 10 mm.....105°C
Melting Pt.....–47 to –48°C

2-Nitro-2-ethyl-1, 3-propanediol
$CH_2OHC(C_2H_5)NO_2CH_2OH$
Melting Pt.....56-57°C

2-Nitro-2-methyl-1, 3-propanediol
$CH_2OHC(CH_3)NO_2CH_2OH$
Melting Pt.....147-149°C

2-Nitro-2-methyl-1-propanol
$CH_3C(CH_3)NO_2CH_2OH$
Melting Pt.....90-91°C

Tris(hydroxymethyl)nitromethane
$(CH_2OH)_3CNO_2$
Melting Pt.....165-170°C

CSC POLYSACCHARIDES

Native Dextran 1,6' α-pyranose polymer

Native dextran is currently being evaluated in the fields of food, cosmetics, paper, pharmaceuticals, textiles, and printing. In these applications, it is being tested as a thickening agent to increase viscosity and to aid in suspension of solids.

CSC SURFACE-ACTIVE AGENTS

Alkaterge®-A, Alkaterge®-E, Alkaterge®-T

This group comprises three new substituted oxazolines. They are cationic, oil-soluble surface-active agents similar in structure and properties to the established surface-active agent, Alkaterge-C. The new products should prove valuable as auxiliary emulsification agents, spreading agents, pigment-grinding assistants, defoaming agents and dispersing agents.

Glucaterges®

These additions to the class of non-ionic surface-active agents are prepared from fatty acids and a polyhydroxy amine. They exhibit a unique combination of properties which suggests new possibilities for ideal performance characteristics under a wide range of conditions.

The outstanding foaming properties, excellent detergency, and good "feel" of Glucaterge-12 suggest applications in hair shampoos, shaving creams, and other cosmetic products. Also, this product is an emulsifying agent for hydrocarbon emulsions, and a dispersing agent for carnauba wax. Tests indicate its usefulness as a wool detergent.

Low-foaming detergent Glucaterge-28 possesses characteristics that recommend its use for mechanical dish-washing compounds and other applications where low-foaming properties combined with strong detergency are desirable. It is a useful component of soap products for hard-water areas, and can also be used to advantage in formulating specialty cleaners such as used on woodwork, walls, glass and tile.

Inert Atmospheres In The Manufacture Of Alkyd Resins

THE potential applications for inert gas atmospheres in industrial processes are numerous and extremely diversified. They range from the blanketing and purging of inflammable liquid storage tanks and pipe lines, as a fire protection measure, to the agitation and exclusion of oxygen during chemical processing. Inflammable liquids, vapors and dusts are encountered in the manufacture of paints and varnishes, the preparation of foods, the production of petroleum derivatives, the manufacture of chemicals and in other miscellaneous industries. These hazardous conditions can be readily controlled and their detrimental effects minimized, if not eliminated, by the use of an inert gas.

An inert gas is primarily an atmosphere from which practically all oxygen or other oxidizing components detrimental to the material being processed have been eliminated. This type of atmosphere can be cheaply produced on the spot in any desired quantity by the use of a compact, easy to operate generator of the type employed by the *Glidden Company* for alkyd resin bodying at their Cleveland plant.

Low Cost Plant Generation

Several years ago, a Surface Combustion DX Atmosphere Generator was installed at this plant for use in the production of alkyd resins. It serves the dual purpose of product quality control and fire protection (See Figure 1).

Although it has been the practice in the paint and varnish industry to use bottled carbon dioxide for this type of work, the Glidden Company found that from a cost and a material handling standpoint, the use of an exothermic inert gas generator operating on-the-spot in their plant was the best all around insurance for top quality continuous alkyd resin production.

The use of an inert atmosphere is advantageous in insuring the consistent production resins that are light in color. By retarding oxidation during the cooking or bodying operation, any discoloring of the final product is prevented and a readily marketable product assured. At the same time this inert gas also serves as a vehicle for the removal of detrimental reaction-water which is always formed during the bodying of these synthetic resins. The bubbling action of this inert gas as it passes up through the boiling mass agitates it and breaks it up, thus permitting the reaction vapor to be readily dispelled.

A 4000 cfh generator unit was found adequate for the 3500-4000 gal. daily alkyd resin production at this Glidden plant. The unit has now been in operation for two years and during this time has been producing a consistently uniform atmosphere for 14-24 hour periods of continuous operation each day with a very minimum of maintenance. These generators are available in capacities ranging from 250 cfh to 15,000 cfh and larger, if production requirements demand.

High Nitrogen Content

DX Atmosphere Gas is produced by the controlled partial combustion of fuel gas (natural gas, coke oven gas or liquefied petroleum gas) followed by cooling and partial dehydration. Its composition is approximately—

Nitrogen	87.3%
Carbon Dioxide	11.5%
Carbon Monoxide	0.7%
Hydrogen	0.5%
Oxygen	0.0%

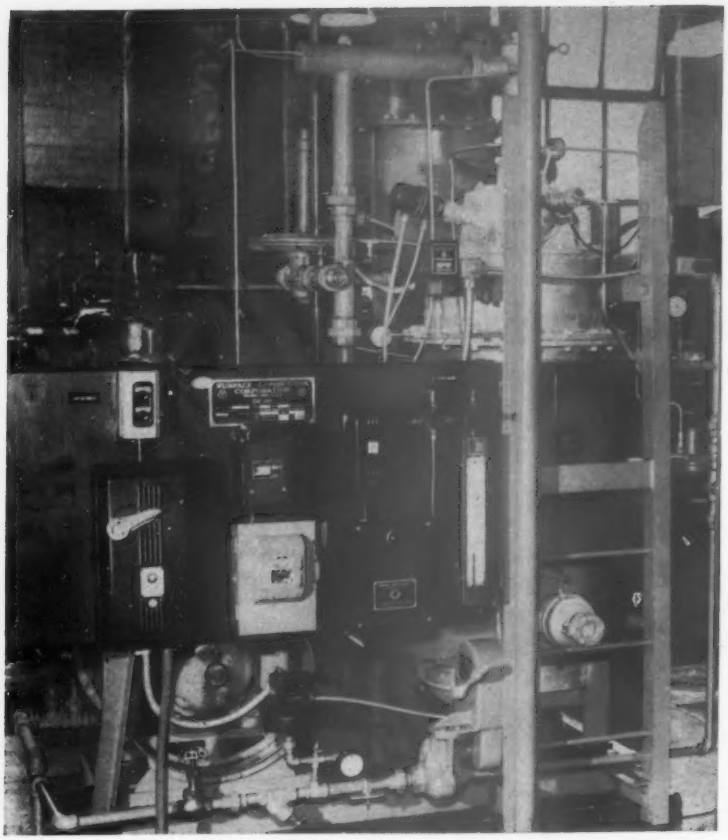


Fig. 1. DX Atmosphere Generator is located in the Glidden Company power plant and is about 800 ft. from alkyd resin bodying tanks.

At the Glidden plant, natural gas of 1000 btu cu. ft. and 12 oz. line pressure, in conjunction with air at 4350 cu. ft. per hour and 1.25 lb. line pressure are used. This combination produces 4000 cu. ft. per hour of high-nitrogen gas (See Figure 2).

Operation Is Simple

The generator unit requires very little attention while in operation. Any average worker, man or woman, can operate it. Temperatures within the combustion chamber are automatically controlled while safeguards continuously maintain proper atmosphere outlet pressure to the storage tank. The unit is also protected against air pressure, fuel gas pressure and electric power failures.

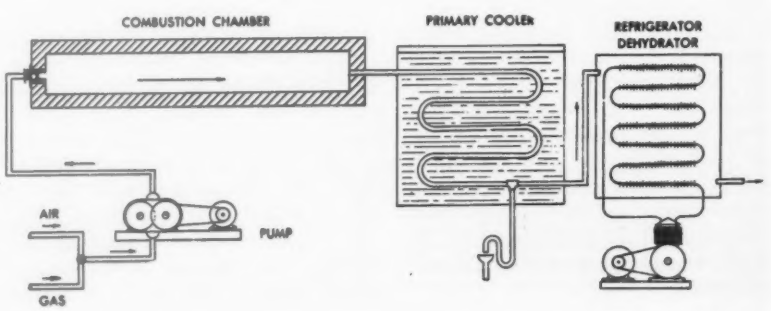
After firing up, the only control necessary is a check of the gas analysis by orsat or by other means. Under continuous operation checks are made as frequently as operating procedures and quality of fuel gas require. With a gas of constant analysis, the correct air-gas proportion will now be constantly maintained in the firing chamber through any set of operating conditions over a wide range of capacity requirements. The operator need turn only one air valve to manually change this heat input. The action of this air under pressure inspirates the correct amount of fuel gas which is intimately mixed and introduced at the burner tip in the correct proportion for proper combustion.

The gas, after formation in the combustion chamber of the generator, is compressed and stored under pressure in a standby tank and transmitted, as required, through a 2 in. pipe line (See Figure 3). It travels over 800 ft. from the storage tank to the alkyd resin bodying tanks and arrives there at a 35-40 psi line pressure (See Figure 4). Inside this alkyd building the inert gas travels through a larger 4 in. pipe line to the two indirect fired batch kettles or autoclaves used for manufacturing the synthetic alkyd resin. These kettles extend over two floors with the mixer drive and inert atmosphere inlet on the second floor and the thinning or reducing vats and filter apparatus on the first floor.

Inert gas is bubbled through the boiling resin during the reaction operation. This action serves to partially agitate the mass and, at the same time, remove the reaction water formed during this process. Due to the fact that this water is an end product, the more rapidly it can be removed, the sooner the reaction can be completed. The gas then collects at the top of the bodying tank, where it serves as a protective atmosphere against flash fires due to the critical combination of conditions resulting from vapor collection and the temperature at which bodying operations are carried out. A bypass valve is also incorporated at this point in case the batch begins to foam and a pressure blanket of inert gas is required on the surface of this boiling mass.

After bodying is completed, the hot resin is moved by gravity to the floor below and mixed in enclosed tanks with a solvent or thinner in an atmosphere of the

Fig. 2. Schematic drawing of DX Generator showing the combustion chamber and cooling equipment.



same DX Gas. Next, the thinned or reduced mixture is forced under inert gas pressure through a filter press to remove any impurities. The finished alkyd resin solution is then moved under 80 psi air pressure to storage tanks some distance away.

At the present time, only bulk resin and thinner conveying and processing within the pipe lines and equipment of the alkyd building are under the protective pressure of inert gas. But, the Glidden Company is seriously considering the adoption of this same inert gas to resin conveying outside of this building and in the outdoor tanks during storage. This will serve to minimize troublesome and expensive "skinning" caused by oxidation and polymerization due to oxygen exposure in the pipe lines and tanks. At the same time this inert gas will serve as a highly efficient fire and explosion protection medium.

Other Applications are Possible

Paint and varnish plants, as a representative field, are rapidly expanding the use of inert gases in their manufacturing processes. In addition to the applications already mentioned, inert atmospheres are also being successfully applied to pigment grinding operations, to the filling of the finished product in cans, and to overall plant fire protection.

Almost every industrial plant or facility that handles volatile fluids such as gasoline, naphtha, and alcohol or experiences critical concentrations of such dusts as starch, sugar and grains, and powdered metals, chemicals and coal, or other combustible materials, would find the use of inert gases generated on-the-spot both economical and efficient. Consistent quality production and fire protection would be promoted. The utilities required—fuel gas, water, air and current—are cheap and readily available and the generator units are compact and easy to operate.

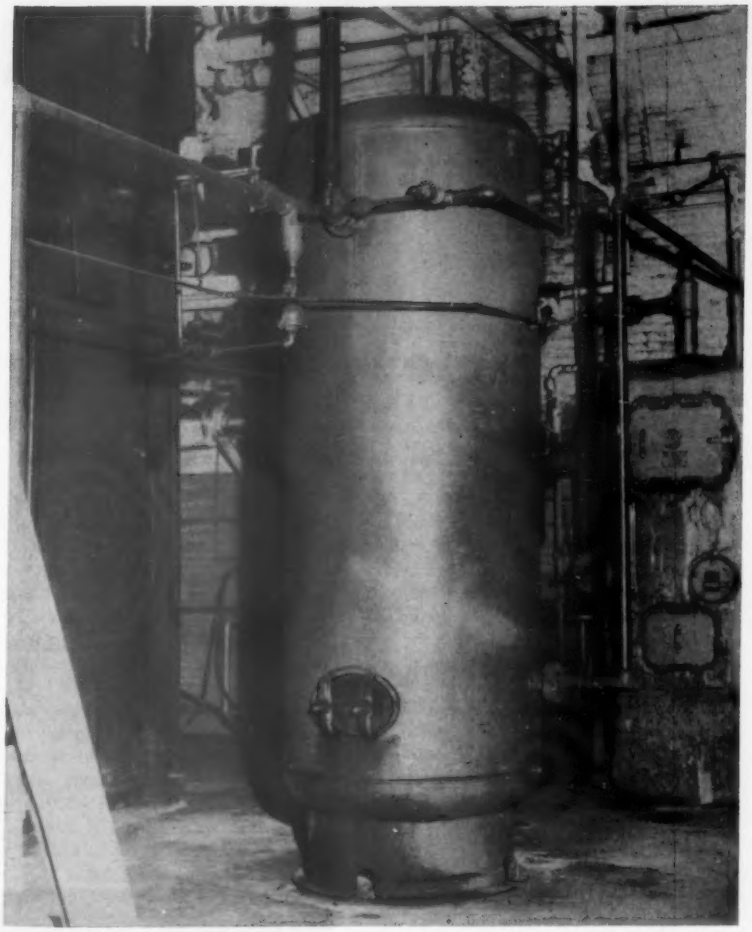


Fig. 3 (above). DX Gas storage tank located in room next to generator. Gas is stored here under pressure near dry gas compressor for use.

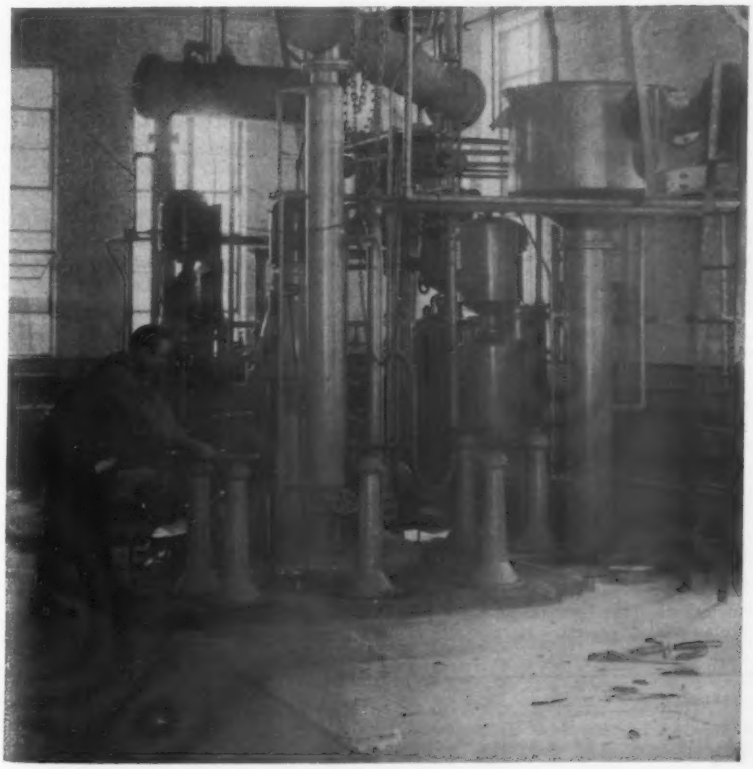


Fig. 4. (below). Top of one of the autoclaves or bodying tanks on 2nd floor of alkyd bldg. DX Gas inlets are located on this floor with the reducing and thinning tanks on floor below.

Some Common Questions About Equipment For Vehicle Manufacture

By STANLEY YOKELL*

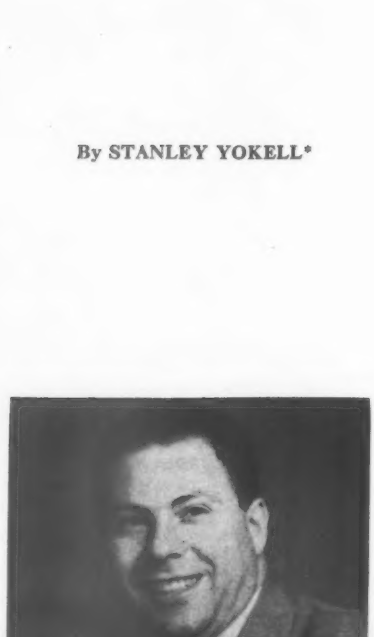
MANUFACTURERS of vehicle equipment are frequently asked questions on its design, manufacture and use. The questions fall into three broad categories. These are: *1. Unit Operations. 2. Mechanical Design and Construction. 3. Operation of Equipment.*

In the first category, some questions on Heat Transfer and Mixing will be discussed.

What capacity furnace is required? The capacity of the furnace is delineated by the amount of heat required to bring the cook to a given temperature in a given time and by the amount of heat that can safely be passed into the batch at any instant. The heat required to bring the batch to a given temperature can be readily estimated by the following equation:

$$q=(0.12W+0.55w(t-t_s) \quad (1)$$

where q is the total heat required in btu, 0.12 is the specific heat of steel in btu per degree fahrenheit per pound, 0.55 is the average specific heat of linseed oil over the range encountered, in the same units, W and w are the weights in pounds of the kettle (including agitator and other parts which become hot) and batch respectively. t_1 is the desired temperature and t_s is the starting temperature of the batch in degrees fahrenheit. It should be noted that this equation is a useful approximation which does not fit the existing conditions exactly in any cook. Linseed oil was chosen as a basis for estimation because of its high specific heat and poor thermal properties relative to other materials ordinarily encountered in vehicle manufacture.



Mr. Yokell is a chemical and professional engineer with a degree in chemical engineering from New York University. He is the sales manager of Industrial Process Engineers and is concerned with the design and manufacture of various equipment for the paint and varnish industry, particularly alkyd, phenolic and urea-formaldehyde resin manufacturing plants. Mr. Yokell is a member of the American Institute of Chemical Engineers and the National Society of Professional Engineers.

*This paper was presented before the New York Vehicle Manufacturer's Group Meeting on May 13, 1933.

Having arrived at the total heat required, it would seem to be a simple matter to divide by the upheat time desired to obtain required furnace capacity in btu per hour. Before this is done, consideration must be given to the amount of heat that can be safely passed into the batch at any instant. Because of metallurgical considerations, it is not desirable to have outside wall temperatures greater than 950°F. This is important where heating is direct by gas, oil or electricity. Where Dowtherm heating is used the Dowtherm temperature rarely exceeds 700°F. The latter limitation is imposed by considerations of physical strength of the equipment at high temperatures and pressures in the temperature range.

The heat transfer process is characterized by the following equation:

$$q/\theta=U\cdot A(T-t) \quad (2)$$

where q/θ is in btu per hour, U is a conductance called the overall coefficient of heat transfer, expressed in btu/°F/Ft.^{2}, A is the surface available for heat transfer in square feet, T is the temperature of the heating source and it is the batch temperature. Calculation

is simplified by assuming the outer wall temperature constant at 950°F in the case of direct fired units, 750 to 800°F in the case of electrically heated systems and 650 to 700°F for Dowtherm heated systems.

The overall coefficient can be estimated at any given temperature from equations in the literature on Mixing and Heat Transfer. Before this is attempted, it should be considered that the range of viscosities of unbodied linseed oil varies from approximately 31 cp at 80°F to less than one hundredth of 31 at 600°F. It should also be noted that the density of unbodied linseed oil varies by approximately 20 percent over the range, and the specific heat by approximately 50 percent. To further complicate matters, a certain amount of bodying takes place during upheat, which causes further variations in the thermal and physical properties of the cook.

When it is considered in addition that the film coefficient of heat transfer varies as $1/(\text{viscosity})^{1/3}$ and that it must be corrected by the ratio of skin to batch temperature viscosities to the 0.14 power, calculation of heat transfer rates can be looked upon as a difficult and possibly unsound means of arriving at furnace sizes. Although the T-t factor decreases with increasing batch temperature, fortunately, the overall coefficient increases at a greater rate so that uniform or even slightly increasing heat input rates can be obtained by adjusting firing rates in the case of gas and oil fired units, or automatically by fixing coil or Dowtherm temperatures in the case of electric or Dowtherm heated system.

For sizing the furnace, then, what is really required is the maximum rate at which heat can safely be put into the kettle, and which will not exceed the skin temperatures noted. Twenty-five thousand btu per hour per square foot is the maximum rate which will not cause excessive skin temperatures recommended by one of the largest furnace manufacturers. Our experience has shown this to be correct. On this basis, upheat times can be predicted with reasonable accuracy. One precaution should be mentioned, and that concerns furnace efficiency and nomenclature of rating. The heat input rate discussed previously has been the delivered or drawn rate at the kettle. It should be established with the manufacturer of the furnace whether his nomenclature in rating the furnace is on a fired basis (or energy input basis to the furnace) or on a delivered basis. If on an input basis, the efficiency must be known to obtain the input size required to deliver the requisite heat. Thus for a gas fired furnace, where on a delivered basis 1,000,000 btu/hr are required, a 2,000,000 btu per hour frunace should be installed, based upon a heating efficiency of 50%. Radiation losses have not been considered since they fall within the limits of accuracy of the method used to size the furnace.

TABLE I

Total Capacity Gallons	Vessel Dimensions	Cold Batch Volume Gallons	Maximum Heat Input to Kettle btu/hr	Estimated Upheat Time at Max. Rate Hrs.
600	54" dia. x 54" straight side	330	675,000	1-½
1,200	66" dia. x 75" straight side	660	900,000	2-½
1,800	78" dia. x 84" straight side	990	1,250,000	2-½
2,500	96" dia. x 62" straight side	1,375	1,550,000	2-½

Table I. Guide in designing new installations.

Table I is based upon gas and oil fired furnaces and can be used as a guide in designing new installations:

In using these figures as a guide, it should be remembered that the heat input may be less than the maximum permissible. It may be more economical or otherwise more desirable to consume more time in coming to temperature. The furnace capacity required drops accordingly. The estimated upheat times in the table were obtained by dividing the maximum heat input to the kettle by the "q" of equation (1).

The figures in the table can also be used with reasonable accuracy for Dowtherm jacketed systems, since the loss in temperature difference is partially compensated for by the increase in heat transfer surface gained by jacketing the vessel wall.

For electrically heated systems, the figures are not applicable unless the furnace coils are maintained at a high enough temperature to radiate sufficient heat to the kettle wall to maintain it at the temperature previously mentioned. The maximum safe coil temperature (which will not cause rapid deterioration of the heating coils) is 1400°F. It is usually necessary to operate in this vicinity unless the kettle wall has been treated to increase its absorptive capacity. Adequate space for the coils is another factor in electric furnace use.

Can an improvement in heat transfer or reaction rates be gained by using more than one mixing impeller? It has been found by tests described in the literature that for the ratios of batch depth to diameter normally encountered in vehicle work no improvement is obtained by using multiple impellers. In a well baffled vessel, when the impellers are one or more impeller diameters apart, the power consumed is directly proportional to the number of impellers. This means that drive and motor size and kettle complexity are increased with very little benefit when multiple impellers are used. For very large capacity vessels, where batch depth to diameter is 2:1 or greater, a good rule of thumb is to locate one impeller at the bottom of each level equivalent in height to a batch diameter.

What diameter impeller will give the best results? Good results are obtained when the impeller diameter is between 35 to 45% of the kettle diameter. Since the film coefficient of heat transfer varies as the 4/3 power of diameter and the power consumption varies as the fifth power of the impeller diameter, the slight gain in heat transfer rate does not usually justify the increased cost of the agitator of larger diameter. Because motors and drives are built in standard sizes and reduction ratios, the diameter for any particular speed is usually chosen to cause a power consumption slightly below one of the standard motor power ratings.

What speed should be used for the impeller? The speed chosen is limited by the same factors of standard power and reduction ratio availability that limit impeller diameter. The film coefficient of heat transfer varies as the 2/3 power of rotational speed. The power consumption of the impeller varies as the cube of the speed. Again the increase in film coefficients does not offset the high power required by high rotational speeds.

Table II is a tabulation of turbine impeller factors for six bladed turbines having diameter to blade width ratios of 6 to 1 which may be used as a guide for vessel design.

The approximate power drawn in the table is based on a specific gravity of 1. When higher specific gravities

TABLE II

Impeller Diameter Inches	Impeller Speed RPM	Approximate HP Drawn	Motor Size Available HP
18	155	1.6	2
18	125	.84	1
21	155	3.45	5
21	125	.92	1 & 1½
24	125	3.44	5
24	100	1.79	2 & 3
30	100	5.36	7½
30	84	3.26	5
36	84	8.12	10
36	68	4.80	5 & 7½

Table II. Tabulation of turbine impeller factors.

are encountered, the power consumption must be adjusted accordingly. The speed listed in the table are standard AGMA output speeds with 1750 rpm input motor speeds.

What are the advantages of variable and multispeed agitators? The advantages are determined by the materials being handled, the process used and the method of operation. For example: one method of operation is to charge lumps of solid material into the kettle and melt down. To determine whether material has been melted enough to continue the process, the agitator is jogged by pushing the starter button on and off. The severest strain on gears and shaft occurs at start up. The load on the impeller is proportional to the cube of the speed. The force of impacts between blades and lumps is proportional to the square of the speed. These factors make a two speed motor advantageous in this situation.

Under turbulent, baffled flow conditions halving the speed of rotation means cutting the power consumption to one eighth of that drawn at the higher speed. It also means reducing the heat transfer rate to 63% of the rate at the higher speed. Therefore, during holding periods, when high heat transfer rates are not required, or at any other time when the mixing requirements is reduced, the equipment can be spared and power economy effected by using multispeed.

Where foaming cannot be controlled by chemical means and is severe, it may be desirable to use variable speed drive. The speed range of variable speed may be three or four times that of the multispeed units standardly advisable. Thus a better balance can be struck between the maximum amount of foaming that can be tolerated in any batch and the maximum speed desirable from a reaction standpoint.

In choosing a variable or multispeed system, the relationship between torque (or twist on the shaft), power and speed of rotation is important. The relationship may be expressed mathematically by the following equation:

$$\text{Torque} = \frac{\text{Horsepower} \times 63{,}000}{\text{rpm}} \quad (3)$$

where torque is expressed in inch-pounds. Multi-speed motors are standardly made in three types. These are constant torque, constant horsepower and variable torque. Halving the speed of a constant torque motor, halves the horsepower output but keeps the twist output the same. Halving the speed of a constant horsepower motor keeps the horsepower constant, but doubles the available twist output. Since agitator drives are rated on the basis of horsepower input and torque output, the drive must be larger for the two speed constant horsepower motor than for either a single speed motor operating at the higher speed or for a two speed constant torque motor. The multispeed variable torque motor delivers less than constant torque and less than half the horsepower so that it must be examined in terms of the possibility of overloading the motor. Ordinarily, either constant or variable torque multispeed motors are installed where multispeed is desirable. The same consideration applies to the use of variable speed drives and should be discussed with the manufacturer of the particular drive under consideration.

What are the limitations on use of spray cooling jackets for temperature control? The limitations on spray cooling jackets are those imposed by geometry. The surface available for cooling increases linearly with diameter. The volume, for any particular straight height of shell, increases as the square of the diameter. Coupled with the trend toward the use of squat vessels for larger capacities (to provide more heat transfer surface on the bottom head) less success is obtained with spray jacketing with increasing size.

What are the limitations on the use of external product coolers? The limitations on external product coolers of either the shell and tube type or the trough and tube type are those imposed by the viscosity temperature characteristics of the product. If the product increases in viscosity very rapidly with temperature decrease, two effects militate against the use of an external cooler. These are sharp decrease in coefficient of heat transfer because of film formation on the inside of the tubes and sharp increase in pumping power required. One way of offsetting these adverse effects to some degree is to limit the quantity of water circulated through the shell of the cooler so that the exit water is at its boiling point.

When the purchase of an external product cooler is under consideration, the purchaser may be in a position to advise the vendor of the worst conditions which the cooler will meet. If this data is furnished together with data on the pressure drop available, the manufacturer is then in a position to make a performance guarantee. As a rule of thumb, it is not usually wise to use tubes less than 1¼" O. D., nor more than our 10′ long tube passes.

How large a condenser is needed for a solvent system reflux condenser? There is no pat answer to this question. The amount of condensing surface depends on the condensing load, on the amount of subcooling desired, if any, on the temperature to which cooling water will be permitted to rise, on the solvent used and on the amount of water of reaction produced. Because it is often difficult for the manufacturer of equipment to obtain all of the data required to rate the condenser, most reflux condensers are oversized. Aside from the higher cost of the equipment, no harmful effects are produced this way.

Sometimes the largest load on the condenser occurs when solvent is added in the kettle for thinning or temperature control. The equipment manufacturer or design engineer should be advised of the method of thinning that will be used.

How large a condenser is required for thinning tanks to be used for quench thinning? Again there is no pat answer to this question. The question can be answered by the design engineer if he knows (1) what the solvent in the thinning tank is, (2) how much solvent is in the tank, (3) what temperature the cook is at when dumped to the thinning tank (4) how fast the batch is charged into the thinning tank.

Not long ago a costly fire was traced directly to an inadequately sized condenser on a thinning tank used for quench thinning. The owner's engineers had installed a transfer pump which cut their transfer time in half, giving no thought to the effect on condenser capacity needed. The result was an overflow of solvent vapors which promptly flashed.

Although the gamut of questions on Unit Operations had not been completely run, some questions in the second category will be discussed.

What does code construction and stamping mean? The A. S. M. E. code for unfired pressure vessels provides a basis for mechanical design and construction that assures the user of equipmsnt constructed in accordance with it a high measure of safety. The latest revision of the code, the 1952 edition, will soon become mandatory in most states and for most insuring agencies. The code delineates material specifications by stating limits of chemical analyses for materials of construction. It also provides for physical tests of materials that meet the chemical requirements. It may come as a surprise to some of us to learn that it is possible to construct a vessel of stainless steel type 316 which meets the chemical analysis of commercial grade material, but which is not acceptable for use in a code stamped vessel because it does not meet physical test requirements.

The code provides for the testing and registering of the quality of work of the workmen fabricating code stamped equipment. It delineates design stresses of materials under different conditions of temperature and pressure. It provides for the use of safety devices. It also covers methods of repair. The code requires a minimum of two inspections by an authorized inspector during fabrication and the witnessing of a pressure test at a pressure in excess of the design pressure by the inspector. Other tests are also provided for.

Although the use of code construction is not mandatory in all states, it is usually a requirement for the purchase of insurance at a reasonable rate Some states provide for an inspection agency, the inspector being an employee of the state. Some states, Ohio for example, require that a pressure vessel constructed for use in the state, comply with a state code, and be inspected by an inspector holding a commission from that state. The most universally applicable inspection is made by inspectors holding a commission from the *National Board of Boiler and Pressure Vessel Inspectors.* Vessels so stamped are generally accepted throughout the world.

Before a fabricator is permitted to place the code stamp on a pressure vessel, his procedures of fabrication and welding facilities as well as his shop are reviewed by the prospective inspection agency. The agency sets forth minimum standards of facilities and qualifies the welders. The Boiler Code committee which meets at regular intervals to review the code has available many experts on the various phases of its work to assist it in its constant review of materials, methods and procedures. The committee also studies questions submitted to it which are of general interest concerning specific questions of design or use. It then issues case reports which become supplementary to the main body of the code.

After a vessel has been inspected and stamped, a copy of the inspector's report is filed with the state labor department, one copy of the data report is provided to the purchaser, plus rubbings of the code stamp on the vessel. One copy is kept on file by the vessel manufacturer for a period of years as determined by law. Should repairs or alterations ever be required, the work can be done under the code as a "code approved repair". Inspection of the repair or alteration, and a pressure test by an authorized inspector maintains the vessel in its code status. Copies of the inspector's report on the repair should be filed with the copies of the original data reports to maintain the value of the equipment.

How large should the explosion disc be, and at what pressure should it be set to burst. The code clearly sets forth the requirements for safety devices. It states that a safety device shall relieve at not more than the maximum allowable working pressure of the vessel and that it shall have a capacity in relief which will prevent more than a ten percent rise in pressure above the maximum allowable working pressure. This means that where a pressure relief valve of the spring loaded type is used, the design pressure ought to be a minimum of ten percent above the working pressure, since safety valves leak before relieving. Where an explosion disc is used as a primary relief a different situation exists. For a disc to burst, it must first yield or stretch. The yield point or pressure at which the disc begins to stretch is considerably lower than the ultimate strength or point at which the disc will burst for most metals. Therefore, if the code is complied with, discs will burst at pressures well below vessel design pressures because of stretching and fatigue, unless the vessel is set to operate at pressures far below design. Where additional safety and a measure of protection against explosion is desired, a common system is to employ a spring loaded valve as a primary relief in one of the lines attached to the vessel and to fit the vessel with an explosion disc as a secondary relief. The spring loaded valve is then set at the design pressure and the safety disc at a sufficiently high pressure to avoid yielding at the operating pressure but less than 50 percent above design pressure. Another point that should be mentioned is that as temperature increases, the stress at which the disc will stretch and burst decreases. It is therefore customary to choose a material of construction for the disc in which the fall off of strength with increasing temperature is minimized. Inconel is one such metal.

Where steady bearings are used, how can shaft wear and maintenance be minimized? The time to minimize shaft wear and maintenance is during the design and construction. The simplest effective method is to fit a replaceable sleeve of a hard material like Hastelloy over the shaft where it goes through the steady bearing. The bushing is then made of the same material as the shaft. It is constructed in two halves for easy replacement.

What is the difference between a standard flanged and dished head and an A. S. M. E. flanged and dished head? The principal differences between standard and code flanged and dished heads are in the radius of dish, the inside corner radius or knuckle radius and the length of straight flange or cylindrical portion. A code head may not be dished to a radius greater than its outside diameter on the cylindrical portion. The inside corner radius of a code head shall be not less than 3 times the thickness nor less than 6% of the outside diameter of the cylindrical portion. Thus a 96" x 3/8" code head would have a knuckle radius of 5¾, whereas a standard head would have a knuckle radius of 1-1/8".

Even where code construction is not used, it is desirable to use code heads. This is because in code heads, there occurs much less stress concentration at the corner because of the more gradual curvature. Both top and bottom heads should be to code dimensions, since the top head must bear the weight and vibratory stresses of the agitator.

The questions which are asked on operation of equipment are usually of too particular a character to be of general interest. A few that have been propounded by several vehicle manufacturers will be discussed.

How cool should water jacketed stuffing boxes be kept? The purpose of water jacketed stuffing boxes is not, as many believe, to cool the shaft, but rather to prevent lubricating grease from becoming too fluid to protect the shaft and help seal against pressure and vapors. Therefore, the colder the water, the better.

How can vibration, hammering and noise be reduced in external product coolers? The sources of vibration, hammering and noise are in the internal spring-loaded bypass of the

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Application and Formulation Problems In Wood Finishing

By B. M. LETSKY*

WOOD today is the same as it was a thousand years ago. Superficially therefore, it would appear that the problem of finishing wood then and today, with protective and decorative coatings, should be identical. This is not so. The same quantity-quality problem which applies to all branches of organic finishing on metal, applies much more acutely to wood. The essential high speed of modern finishing raises not only the quantity-time problem, but brings to light new properties and qualities in both the timber and the finishing materials, which must be considered before satisfactory uniform results can be achieved. The qualitative basis of wood finishing had to be fundamentally changed before quantitative results could be obtained.

When the craftsman of India pressed his stick of shellac against his hand carved wooden vase on a primitive lathe he achieved a finish which sometimes lasted hundreds of years. Quality and durability were unimpeachable. Time and cost were immaterial.

Today the problem is to equal and surpass this quality of finish on articles varying in size from a tool handle to a dining table. Furthermore, we must satisfy the world demand from a twentyfold greater population with a thousandfold increased consumption. That is why, although we cannot and do not disparage the achievments of the past, the furniture industry of today must make full use of the latest materials and applications methods produced by the chemist and the engineer.

Essentials

What are the main essentials of good wood finishing?

1. The wood should be protected and sealed; protected against heat, dirt and abrasion and sealed from the effects of moisture, evaporation and weathering which would cause dimensional structural changes in the timber.
2. The finish should be clear and smooth, and enhance the natural beauty of the wood underneath.
3. The finish should maintain its appearance, and the protection and adhesion should, if possible, equal the life of the article.

When it is considered that the wood itself is unstable in dimensions and that the protective film is only some 2-1 thousandths of an inch thick, then we can see that the problem is not an easy one. Moreover, the speed factor demands that the finishing operation should be adaptable to mass production.

The old craftsman had quality first and speed "also ran" as his main springs for action. He water-stained his timber and then papered it after over night drying. He would then oil the wood to emphasize the beauty and clarity of the figure. He would match any inequality in color direct on the timber. He would then apply his first rubber of polish some 24 or even 48 hours later. This served the dual purpose of laying the foundation of his finish and bringing excess oil to the surface because of the special oil proof nature of shellac. He would then stand the job down for a further 48 hours before applying the main body of the finish. This was again applied by rubber using a little linseed or white mineral oil as a lubricant. After this the work was stood down for 3-6 months or more, before the final finish was applied, again by hand. Excess oil was removed by using "half and half" rubber (French polish diluted with alcohol), gum benzoin and finally vitriol and chalk. A high order of skill was required and the finish obtained was unsurpassed by any modern method.

When we analyse the above operations, we see at once how

paramount is the time factor. Only the very liberal use of the "great healer" enabled the French polisher to firstly use materials like water, oil and shellac which are incompatible and then to neutralize the natural properties of the wood and the shrinkage of the finish into the grain of the timber.

In mass production wood finishing, six months is compressed into six hours, nature must be violated and incompatabilities must be reconciled. The problem of sinkage in particular becomes much more acute. There is no need however, to sigh over lost arts and derelect craftsmanship. We can and do learn from tradition, but we can also prove the most inspiring of modern experiences i.e. that man can change, as well as be changed by, nature.

It is the mixture of the past and present which account for most illogicalities. Wood finishing still suffers from the hangover which is inevitable when six months finishing (or drinking) is compressed into six hours. Every material and operation should be designed to eliminate incompatabilities and neutralise those disadvantages of wood which emerge under the pressure of the time factor.

It is the purpose of this article to ascertain how far chemical and physical considerations have been adapted to application and formulation problems today.

The first factor is the nature of wood itself. Wood must contain a certain minimum of moisture to retain strength and workability. The moisture content of timber in Great Britain varies from 10-15% depending on the wood. Hardwood as a rule contains less moisture and are less sensitive to the effects of moisture. The first task of the manufacturer therefore, is to bring the moisture content to that figure at which the wood is at equilibrium with its environment. If this figure is too high it will lose moisture. If it is too low it will tend to absorb moisture. In either case, dimensional changes will occur. There is an optimum figure which will vary with climates of different humidity. For example, in America the moisture content is adjusted from 7-9%. Exporters of furniture to the U. S. should take due note of this fact.

Stains

Given wood of the correct maturity the first operation is either stain or stain filler. On deep grained veneers like walnut, mahogany or oak, filler is necessary to save spraying operations and the substantial amount of lacquer which would be required to fill the grain. On maple and sycamore where the grain is shallow, filling is usually not necessary. Stains for wood fall in four main classes. These are water stains, oil stains, spirit stains and permanent non grain-raising stains. Water stains are excellent for clarity and permanence. In addition to the traditional vandyke crystals, bichromate crystals, logwood chips, permangate, cochineal, etc., there comes a range of modern acid dyes which are soluble in water and also in carefully balanced mixtures of alcohol, carbitol or methyl cellosolve, toluol or xylol. These acid dyes are usually the sodium salts of organic acid dyes. They have a direct affinity for cellulose fibers, including of course, wood. The oil soluble type includes the water insoluble azo dyes, which color the wood by absorption and deposition. These are not so fast to light. Spirit dyes are usually employed in the spray shading stains and used to be somewhat fugitive. Bitumens are still employed largely in this country for a wide range of oak, walnut and mahogany base stains. They are permanent and give excellent clarity. Moreover, they are soluble in a cheap range of solvents like white spirit, naphtha, toluol and xylol and are therefore, very economical in use.

Fillers

The question of wood filler or combined stain and filler is still in a state of flux. The modern stain filler, fills moderately well, dries in a reasonable time, is easy to apply and remove, gives a clear grain, but is still by no means a perfect answer to the filling problem. Usual formulation is the more or less hap-hazard mixture of silica, china clay, barytes, burnt Turkey umber, chalk, talc, slate powder in mediums of oil varnish, linseed oil, gold size, white spirit, naphtha or xylol. No organized and scientific attention in most cases, has been given to the question of adhesion, puffing in the grain, sinkage and compatibility with the final coats. The main criteria have been speed, ease of application and clarity of figure in the wood. The perfect filler would have the following properties:-

1. Air dry in less than one hour.
2. Applicable by hand or gun and easily wiped off.
3. Maximum clarity of figure.
4. No puffing in the grain under sealer or lacquer.
5. Good adhesion to the wood and to the sealer or lacquer.
6. No raising of the grain.
7. Compatible with either sealer or lacquer.

There is no filler today which meets all the above conditions. The best of them are working compromises. One of the severly limiting factors is, from the chemist's point of view the least important, and from the workman's point of view the most important, if the filler will not wipe off easily after application on a wardrobe or a dining table, then it is ruled out even though its other properties may be near perfection. There are a number of mediums available today which could give many of the properties required for a first class filler. Research on wood adhesives from 1940 onwards[1] have indicated that, in the main, they should be polar[2] in character to insure maximum adhesion. These considerations obviously apply with equal force to wood filler. This factor is rarely considered when the filler is formulated. Spirit soluble phenolics, dispersion phenolics, shellac, catalysed ureas, are excellent for filling, adhesion and non-shrink properties. Unfortunately their working properties rule them out for anything but small surfaces. Use of high boiling alcohols recently made available like nonanol and decanol might be helpful, but then force drying[3] would be necessary to remove excess solvent. Further improvements lie in the field of emulsion type fillers[4] which do not raise

the grain. Mechanical methods of filler application and removal can also aleviate this problem. Standard buffing machines and sanding machines have been adapted with partial success for this purpose.

Sealer

The question of sealer has engaged considerable attention during the last few years[5]. Many manufacturers have used shellac or nitro-cellulose separately or in combination. The cellulose sealers have been, in the main, low in solids with some 2% of stearates or hard synthetic wax to give ease of papering. This type of sealer air dries in 15-30 minutes and is a very useful product particularly on rough timber. The tendency during the last two years however, has been in the production of higher and higher solids in order to save time and material. That is why there has been a large scale increase in the use of high solids and hot lacquers. The advantages and disadvantages of shellac as a sealer are well known. It is still superior to most air drying synthetic resins for solvent resistance and sealing properties. Its flow properties when sprayed are not too good, and it has the disadvantage of being thermoplastic, and therefore unsuitable for export finishes. Moreover, there is always the risk of adhesion and cracking difficulties if too thick a film is applied. The high solids synthetic resin sealer has been made possible by the introduction of hard maleic resins and by rapid drying short oil alkyds. These have excellent flow and rapid hardening and give great economies in the amount of finishing lacquer necessary to achieve the final result.

Drying

The necessity for rapid air drying severely limits the number of suitable resins. There has been increased interest therefore, in forced drying and low temperature baking for the furniture trade. One of the largest factories in Britain has successfully used low temperature polymerisation in bulk production for some three years. The temperature used for the finishing coat is 140°F for one hour. The sealing coat is a standard cellulose lacquer, force dried, at about 100°F for 15-30 minutes' It is therefore, impervious to the xylol-butyl combinations used as solvents for the catalysed urea finishing coat. The procedure is direct and simple and fully conforms with most standard finishing schedules. In order to prevent warping of the timber, the air is humidified by steam injection at about 40-45% relative humidity. The finish has exceptional flow, toughness and heat resistance and is superior in this respect to most cellulose finishes. The capital expenditure however, is considerable. One other drawback is intrinsic to British methods of furniture finishing. Pullover is almost universally used by manufacturers in this country on the finishing coat of lacquer. Pullover is essentially a solvent mixture containing 20-50% of nitro-cellulose solvent (or potential solvent), diluted with petroleum ether. Used in a pad, it smooths out a spray ripple and gives a finish adequate for medium class furniture. The process is rapid and requires a minimum of skill. It could not be used on a fully polymerized final coat. This would be either unaffected by pullover or would swell and go dull. That is why further alternatives to the 100% synthetic resin coating have been adopted in many factories. The high resin base coat or sealer can be air dried or partly polymerized at low temperature (110-120°F). This obviates the need for humidity control and gives an excellent non-sink foundation under the normal cellulose finishing coat.

Other factories have adopted infra-red or convection forced drying at 100-110°F applied for some 5-6 minutes on each successive coat during the finishing operation. The main problem in forced drying or low temperature baking is the nature of wood itself. The tendency to absorb solvents and poor heat conductivity are responsible for the ever present risk of blistering unless rigid provision is made to eliminate trapped solvent. The thicker the finishing coats, the greater the risk. That is why the use of cellulose hot lacquers under forced heat have not yet been completely successful. Protracted "flashing off" time is essential to eliminate the risk of blistering and this is one problem which still awaits solution by the joint efforts of the lacquer and the furniture manufacturer. For the present, where cellulose hot lacquers are used it is better to use forced drying only at the filler and sealer stages.

Finishing Coats

For finishing coats the use of hot lacquer has increased substantially during the last five years. This has been due partly to the improvement in available plants. There are several types which now pass the most exacting fire regulations and give trouble-free production. They can be classified into five main types: first, those based on the electric thermostatic heating of water as a heating medium, as in the A.I.D. and Atlas Diesel plant; secondly, those based on metal to metal electric heating of the lacquer line, as in the Bede plant; thirdly, those based on electric heating of air as a medium, as in the Swedish Aerograph De Vilbiss hot lacquer plant; fourthly, those based on the steam heating of water as in the Vital plant; fifthly, the use of super heated steam both to atomise the air directly and to heat the lacquer, as patented by Du Pont de Nemours of the U.S.A. All of the first four types are used successfully in Great Britain. Some furniture manufacturers have even designed their own steam plant to feed two, three or more hot lacquer guns simultaneously. As far as the writer is aware, there are no super heated steam hot lacquer plants in production use in Great Britain. The principle is sound but demands a super heater in the circuit and special spray guns with shield and steam trap. The main advantage claimed for this type of hot lacquer plant is that super heated steam is a source for both heat and atomization, and is cheaper than the combined cost of compressed air and heating by other methods.

Formulation

As far as the formulation of finishing lacquers is concerned, there is no doubt that the high solids lacquer has come to stay. Apart from saving in cost and operations, it also eliminates the

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MASONRY COATINGS — TYPES AND USES

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MASONRY coatings have always presented a serious problem to the paint manufacturer. So many variables exist in a masonry wall and other similar materials that it would be a difficult task to formulate one coating that will act as a panacea for all their ills. The failure we are concerned with in this article is not one due to atmospheric conditions, but one attributed to the nature, condition and presence of moisture and various chemicals in the masonry itself. Many types of coatings have been used to aid in counteracting the above agents of destruction, and to list and describe all of them would be beyond the scope of this article. The principal formulations produced by outstanding manufacturers, and known to have some merit will be discussed only. Due to the limitations of this article, and since many kinds of surfaces exist requiring detailed explanation, surfaces of a cementitious nature will be solely discussed, unless otherwise stated.

Cement Manufacture

Before describing the coatings suitable for masonry and other allied surfaces, it may be advantageous and propitious at this time to discuss the manufacture of cement, and the nature of the compounds existing therein. In this manner the problems facing the paint manufacturer will be appreciated and more easily understood.

The primary and most important reaction in the manufacture of cement is the formation of tri-calcium silicate and tri-calcium aluminate. This is effected by the ignition of calcium carbonate and aluminum silicate. The natural raw materials that are representative of the above are limestone and clay, which occur in various forms in nature. Chalk is a limestone derived from marine organisms and is a suitable source of lime. Cement manufacture consists of producing a homogeneous mixture of the limestone and clay in the proper proportions, with subsequent burning of the mixture in a kiln to form a clinker. In the burning process, part of the clinker is liquified, and at this point reaction between the limestone and clay takes place. The next step in the process is the grinding of the clinker to a fine powder followed by the addition of calcium sulphate, commonly called gypsum. The purpose of the gypsum is to control the setting of the cement.

The above brief description of the manufacture of cement may be accomplished by either of two processes, namely the wet or dry method, depending on whether the raw materials are mixed and ground in a wet or dry condition. Hard clays and limestones are suitable for use in the dry process, and soft materials are adaptable for use in the wet process. In the dry method, the raw materials are added to a rotating cylinder where they are crushed and dried. The mixing and grinding of the crushed clay and limestone are executed in tube mills consisting of rotating steel cylinders having a grinding media consisting usually of steel balls. The tube mills are in continuous operation and are divided into several compartments, each compartment containing steel balls of a different size. Crushed raw material is fed in at one end and is discharged at the other. In the wet process, the comparatively softer limestone and clay are broken up and incorporated in wash mills consisting of circular pits, together with sufficient water to form a creamy slurry. The solid material is crushed to a fine state and passed through the screens in the walls of the circular pit. If a finer particle size is desired the process is repeated using finer screens. The proportion of lime in the mix is controlled by analytical methods. The drying of the cement takes place in the upper part of the rotary kiln, and then as it descends in the kiln, the dried slurry is transformed into hard granular clinkers. The clinkers then pass on to the grinding mills. This brief description of cement manufacture is applicable to most plants with only slight adjustments in detail.

Composition

Cement is composed of a number of compounds, the most important ones being the di- and tri-calcium silicates and the di- and tri-calcium aluminates, all present in the anhydrous form. Free or uncombined lime occurs to a small extent. It is usually present as the hydrated form and is derived from the decomposition of calcium carbonate in the burning process. When these compounds are brought into contact with water, the phenomenom of setting and hardening of cement occurs. This is caused by the hydration of the di- and tricalcium silicates and the di- and tri-calcium aluminates. The ultimate hardening of cement is due to the hydration of tri-calcium silicate, and to a

lesser degree to the di-calcium silicate. More hydrated lime is formed due to the hydration process and hence the content is increased in the masonry. The setting of tri-calcium aluminate takes place in a few hours, and only the outer surface of each particle is hydrated. The inner core remains as the anhydrous form. The hydration of tri-calcium aluminate does not liberate lime. The reaction of this compound with water liberates heat and is responsible for the initial set obtained in cements.

Causes of Failures

The condition of the masonry plays an important part in the durability of the coating. The presence of lime, moisture and alkali salts are the principal causes in the failure of the paint film. Sometimes it is the water itself that causes the final disruption of the film in the form of blistering and the eventual flaking of the film; this is usually true in the case of unsaponifiable films. The attack may also be caused by the dissolving in water of the chemicals present in the cement itself. Such chemical substances as lime and the alkali salts of potassium and sodium will react with saponifiable films to form soaps, either of the insoluble or soluble type, depending on whether the agent is lime or the salts of potassium or sodium. Due to the insolubility of the lime soaps, a layer is formed where it comes in contact with the film. This largely protects the remaining film from further destruction, since the soap is situated between the film and the cement. But this soap formation invariably causes a reduction in the adhesion of the film to the surface with the ultimate appearance of blisters and flaking. Poor performance of a saponifiable base film can also be traced to the reaction of lime or calcium hydroxide with the alkali salts in the presence of moisture. This will liberate free potassium or sodium hydroxides. They, in turn, will attack a film if it is saponifiable to produce water soluble soaps. This will eventually develop stickiness and softness of the film, with the final result that the film is washed away by rain. Naturally, all of the above reactions would not take place if the moisture was not present. Moisture is the key to all the failures of masonry coatings. A dry aged masonry wall will not cause any disturbance of the paint film.

Another feature that is of considerable importance and that may exert a tremendous effect on the durability of the masonry coating is the degree of porosity of the wall itself. A dense wall, or one with fine pores, will decrease the diffusion of water through it, and the reverse is true in the case of a coarse wall or one with large pores. A careful examination of the masonry wall is essential to prevent failure, and many discouraging results could be prevented if painting was delayed when one notices a wall that is not well matured or dried. The exception to this is the use of special inorganic coatings—these will be discussed later.

Why Paint?

Since cement is composed mainly of the inorganic salts of tri-calcium silicate and tri-calcium aluminate, it is perfectly understandable if the reader should ask the question, "Why paint such an inactive and durable surface?" Reasons for painting a masonry surface are numerous. In the first place the cement-gray color is not the best eye pleasing scenery to look at. Numerous physical and chemical reactions take place due to impurities in the wall; which produce an unsightly effect.

Staining—This usually brown discoloration is due to the presence of iron and organic matter in the wall.

Dampness—Water entering a wall sometimes penetrates to the inner surface causing flaking and peeling of the interior paint. Dampness in the interior invariably will cause unfavorable living conditions.

Efflorescence—The fundamental cause of efflorescence on a surface is due to the soluble salts contained therein. It occurs on masonry as a whitish deposit, and usually indicates the presence of moisture and soluble sulphate salts. The moisture dissolves the salts, and eventually when conditions are favorable for evaporation, transfers them to the surface.

The moisture may have entered the wall by any of the following methods: (1) During construction of the wall; The wall may have been exposed to rain and snow. (2) From improperly flashed parapet walls at the roof. (3) Leaky gutters and spouts. (4) From the earth at the base of the wall. (5) From cracks and poor joints in the wall. (6) Poorly constructed cornices and sills.

Freezing and Thawing—Water expands approximately 9% in volume during freezing, and when it is trapped in cavities the pressure becomes enormous. In a wet wall the enclosed water contained in the pores tends to force the mortar apart, or to set up severe internal stresses on freezing. The effect is intensified by repetition of the process of freezing and thawing. Microscopic cracks begin to develop, and are filled with more water, which upon subsequent freezing are enlarged and produce further cracking and fissuring. The first appearance of frost action is usually noticeable by the flaking of the cement surface. This works progressively deeper into the mass. Dry masonry is not effected by frost. The ability of the wall to prevent the entrance of moisture into its pores will naturally increase immeasurably its resistance to efflorescence, fissuring and cracking due to frost, interior dampness and peeling. A good method for preventing the entrance of moisture into a wall surface is to coat it with a suitable material specifically designed for the purpose. This coating may be of the pigmented type, or a transparent membrane, if the cement gray or original color of the wall is desired.

There are a large variety of materials which are applied to the surface of masonry either to waterproof, decorate or preserve it. In any case the coatings must be resistant to the salts and moisture existing in the cement. The conditions which the surface dressings have to withstand are severe, and each situation should be carefully surveyed before attempting to select the proper coating. A description of the most outstanding types existing today will be discussed below.

Masonry coatings may be divided into two outstanding classes; namely inorganic and the organic types.

Inorganic Type

Cementitious Coatings—When a damp masonry surface requires painting, the conventional continuous film type coating is ineffective. It peels off and blisters due to the moisture and soap formation trapped underneath. A water dispersible coating forming a discontinuous film has proven very effective when damp conditions are prevalent. It is composed of cementitious inorganic matter compounded with alkali resistant colors that will enhance the decorative value and waterproofness of the applied surface. When it is applied to a masonry wall, the discontinuous film allows the surface to "breathe"; that is, the water has an avenue of escape through small openings existing in such a coating without disturbing it in any manner whatsoever. The preparation of the surface and the application of the coating play an important role in this system. The success or longevity of the product depends on an adequate and religious adherence to all the precautions prescribed by the manufacturer. Many years of experience has consistently demonstrated that specific rules must be adhered to, if uniform results are to be obtained. The most important step in the entire process is the preparation of the masonry surface. For best results the surface must be thoroughly cleaned of dirt, grease, efflorescence and also removal of the carbonated skin" of the masonry. Two methods are widely used to perform the cleaning operation, namely: sandblasting and acid etching. In sandblasting, clean cut sand is directed against the surface by means of air

pressure with such force that the top layer is removed leaving a clean and roughened surface suitable for recoating. Acid etching requires the use of a 10% to 20% solution of muriatic acid. This solution is applied with a stiff bristle brush over the surface. The carbonated and efflorescent surface is readily removed in this manner exposing a clean underlayer of masonry. Here again the surface is roughened and thus made suitable for the cementitious coating. Before applying the coating, the surface must be thoroughly dampened. This decreases the absorption rate of the surface so that a minimum quantity of water is removed from the coating when it is applied. The surface of the masonry is composed of millions of tiny openings which, through capillary action, will absorb water. Naturally, the water is required by the coating to complete its hydration of the tri-calcium silicate and the tri-calcium aluminate contained therein. If an excessive amount of water is removed, insufficient hydration will result, leaving a coating lacking in strength and adhesion. Excessive evaporation of moisture from the coating, after it has been applied, is countered by gently spraying the coating with water after it has been allowed to dry for one to two hours. Usually two coats of the material is applied. Adhesion of the coating to the masonry wall is accomplished by mechanical adhesion and dual hydration. Mechanical adhesion is dependent on the porosity of the surface so that the coating can imbed itself in the crevices or pores existing therein. A masonry wall cleaned by the methods mentioned above exposes tri-calcium silicate and tri-calcium aluminate which has not been hydrated. When the surface is dampened and the cementitious coating applied, hydration occurs simultaneously on the newly exposed masonry surface and the silicates and aluminates contained in the coating. Hence a natural and common bond is formed between them, aiding materially in promoting adhesion. In other words, the coating becomes an integral part of the wall. The above statement that unreacted tri-calcium silicates and tri-calcium aluminates are present in cement already hardened can be demonstrated in the following manner. Thoroughly cured and hardened cement is broken up and pulverized. This powder is then mixed with water to form a putty-like mass, and allowed to harden. While the material will not have the strength of the original cement it will possess sufficient strength to form a good bond with a coating containing similar material. Hydration of the silicates and the aluminates occur on the surface and when the surface is disturbed the unreacted salt will be exposed to further hydration when the proper conditions exist.

The coating is applied by a stiff bristle brush so that the material can be worked into the pores of the surface. In this manner the density of the wall is increased, thus minimizing the penetration of water through the walls.

A coating such as described above will have excellent outdoor durability, will be resistant to the alkali conditions existing in masonry walls, and because of the pigments used (mostly oxides of chromium and iron) will possess outstanding non-fading characteristics. Due to the cementitious nature of this finish, and also because of its dependence for adhesion on the porosity of the wall and the chemical reaction that takes place between the finish and the wall, this type of coating is not suitable for use over painted, wooden and metallic surfaces.

Silicate Type Coating—A silicate coating is composed mainly of sodium or potassium silicate as the vehicle, and silica and non-fading alkali resistant colors as the pigment. This type of coating becomes insoluble when applied to a masonry wall due to the reaction of the potassium or sodium silicate with the lime and other salts present in cement, forming insoluble calcium silicates. Here again, as in the cementitious coatings, this finish can be applied over wet and virgin masonry surfaces. The same cleaning and application precautions must be observed if a durable non-flaking coating is to be obtained. As with the cementitious product, the silicate paint becomes an integral part of the wall due to the reaction occurring between the coating and the surface. Naturally, since the success of this form of finish depends on its ability to react with the surface to be painted, any non-reactive surface such as painted, wooden and metallic walls should be avoided.

Organic Type

Rubber Based Coatings—The chemical resistant butadiene-styrene polymer and chlorinated rubbers are well adapted for use in masonry finishes due to their excellent alkali and water resistance. Since they are non-oxidizing they are not affected by oxygen, and dry by simple evaporation of the solvents used to disperse them. They are readily soluble in esters, terpenes, aromatics and ketone solvents. Numerous plasticizers are available for use with these polymers, and the selection of a specific type is dependent on the end use of the finished product. For excellent durability and chemical resistance, a plasticizer for a masonry coating must, quite obviously, possess similar chemical resistant properties as the polymer used. Chlorinated paraffins (40% chlorine content) and chlorinated diphenyls are widely employed for this purpose The resins commonly used in conjunction with the rubber polymers are the cumars and the chlorinated waxes (70% chlorine content). These resins are added to increase gloss, hardness and to lower the cost of the finished product. Here again their alkali resistance make these resins very popular with paint manufacturers. Oils, although quite compatible with the chlorinated rubbers as a rule, are not too compatible with the butadiene-styrene polymers. Only small percentages, such as 5% to 10% should be employed. They increase the adhesion of the film to the surface, but their most glaring weakness in masonry finishes is the poor alkali resistance they impart to the film, regardless of the small percentages used. If a formulation requires its use for some particular reason, not more than 5% should be used based on the weight of the polymer. In order to obtain excellent color stability, alkali resistant and non-fading pigments must be used.

The advantages of this type of finish over an oil base paint are:

(1) Rapid Drying—Since drying is effected by simple evaporation, the comparatively long process of oxidation and polymerization of an oil film is eliminated. The drying is dependent on the degree of evaporation of the solvent used, and can be adjusted to dry in a very short time if desired.

(2) Excellent Alkali Resistance—The butadiene-styrene and chlorinated rubber polymers are far superior to an oil base paint in this respect when properly formulated.
(3) Excellent Water Resistance—The water resistance far surpasses that of an oil base material.

This type of coating is suitable over previously painted surfaces or over dried masonry only. It will not adhere well to dampened walls, the same disadvantage applies to all other solvent type continuous finishes. If the wall is green and this form of finish is desired, it should be allowed to age before attempting to coat it. Wet walls, although aged, must be permitted to dry before application of the above product is attempted.

Oil Paints—Oil based masonry formulations are widely used, and are composed mainly of linseed and tung oils. This form of finish is suitable only when a wall is aged and dry. Wet walls will cause failure due to blistering and flaking; and if free alkali is present, the deterioration of the film will be due to saponification of the oils. A coating of this type must be employed judiciously, and only after a wall has been examined

(*Turn to page* 58)

Paint Industries' Show Scheduled Oct. 27-30 in Atlantic City, N.J.

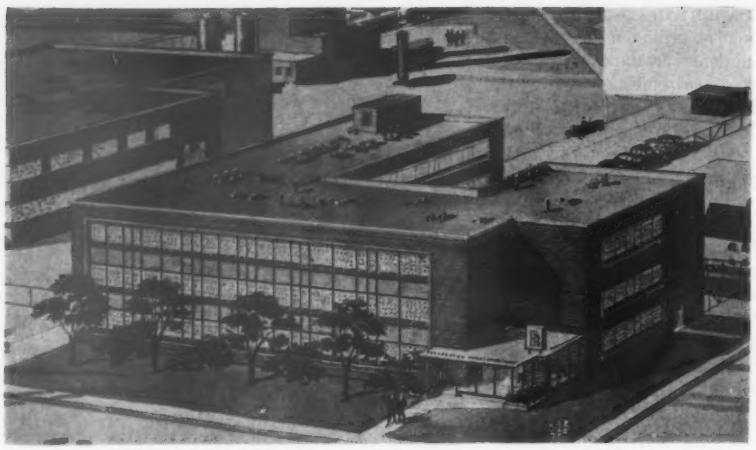
More than 60 companies have already signed for exhibit space at the 1953 Paint Industries Show scheduled October 27-30, at Haddon Hall in Atlantic City, N. J.

Contracts for space at the Show have been mailed to a number of representative suppliers of raw materials and equipment.

Among the firms who are listed as exhibitors are: Paul O. Abee, Inc., Advance Solvents & Chemical Corp., C. M. Ambrose Co., American Cyanamid Co., Anderson-Prichard Oil Corp., Archer-Daniels-Midland Co., Atlas Electric Devices Co., Atlas Powder Co., Bakelite Co., Baker Castor Oil Co., Bede Products, Inc., Bennett Industries, Inc., Binney & Smith Co., Bowserm Inc., Burt Machine Co., Godfrey L. Cabot, Inc., Carbide & Carbon Chemicals Co., Carbola Chemical Co., Inc., Carbon Dispersions, Inc., and Cargill, Inc.

Also: Celanese Corporation of America, Chisholm-Ryder Co., Cuno Engineering Corp., J. H. Day Co., Dow Chemical Co., Eastman Chemical Products, Inc., Edgar Brothers Co., Epworth Manufacturing Co., Inc., Fostoria Pressed Steel Corp., Gardner Laboratory, Inc., General Electric Co., Goodyear Tire & Rubber Co., Inc., Gray Co., Inc., Harshaw Chemical Co., Hercules Filter Corp., Hercules Powder Co., Herman Hockmeyer & Co., Spencer Kellogg & Sons, Inc., Kent Machine Works, Inc., Kanetic Dispersion Corp., Lead Industries Association, J. M. Lehmann Co., Inc., Metals Disintegrating Co., Inc., Mineral Pigments Corp., Monsanto Chemical Co., and Morehouse Industries.

Also: Naftone, Inc., Neville Co., Nopco Chemical Co., Nuodex Products Vegetable Oil Corp., Paint Industry Magazine, Patterson Foundry & Machine Co., Pennsylvania Falk Chemical Co., Plaskon Div., L-O-F Glass Co., R-B-H Dispersion, Reichhold Chemicals, Inc., Rheem Manufacturing Co., Rohm & Haas Co., Chas. Ross & Son Co., Ross & Rowe, Inc., Shell Chemical Corp., Shell Oil Co., Sparkler Manufacturing Co., Special Equipment Corp., Troy Engine & Machine Co., Union Bag & Paper Corp., Upressit Products Co., U.S. Industrial Chemicals Co., U.S. Stoneware Co., T. F. Washburn Co., C. K. Williams & Co., Witco Chemical Co.



How Pittsburgh Plate's Paint Laboratory at Springdale, Pa., will look when completed.

Pittsburgh Plate Glass To Begin Construction on Paint Laboratory

The Pittsburgh Plate Glass Company will begin construction immediately on a three story reinforced concrete structure with brick facing, to house the company's paint division research laboratories at Springdale, Pa.

Located about 14 miles from downtown Pittsburgh, the building will be constructed adjacent to the firm's paint manufacturing plant. Facilities will include an air conditioned laboratory covering about 68,000 square feet of floor space, a library and lecture room.

Pittsburgh Plate's basic paint research program will be centered at the new Springdale location. The paint division's technical department, however, with headquarters at Milwaukee and branches at each of the firm's paint producing plants, will continue to function at present locations.

American Soybean Assoc. To Hold Annual Convention August 20-21

Four half-day sessions attacking present-day problems in the soybean industry will be included in the 33rd Annual Convention of the American Soybean Association scheduled August 20-21, at the Hotel Jefferson, St. Louis, Mo.

An outlook forum with a panel discussion on *Where Are Soybeans Going* will feature the final session Friday afternoon Aug. 21. Speakers will cover marketing soybean oil meal, research, world markets, the federal government, and fats and oils.

Other sessions will discuss the general subjects of production, soy products and marketing.

The annual Association banquet and presentation of honorary life memberships will be held Thursday evening, August 20.

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Interchemical Corp. Establishes Commercial Research Department

A commercial research department has been established by the Interchemical Corporation, New York.

The new organization will consolidate activities carried on informally in the past by other departments.

Dr. Zeno Wicks, former member of the Interchemical Research Laboratories, will manage the new department. He will be assisted by Henry Young and John Duane, with Milton Zucker serving as acting consultant.

Drexel Institute of Technology Awarded $25,000 Publicker Grant

The Drexel Institute of Technology Philadelphia, Pa., has been awarded a $25,000 grant by the Rose Publicker and Harry Publicker Trust of Philadelphia.

This latest gift to Drexel's 5 million dollar expansion and modernization program will be used to construct the Organic Chemistry Laboratory, which will bear the Publicker name, in the proposed Basic Sciences Building.

When completed, the building will be the third major unit to be built at the College since the end of World War II.

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Brown Chemicals Now Operating As Division of Swan-Finch Co.

Brown Chemicals, New York, N. Y., has announced it is now operating as the Chemical Division of the Swan-Finch Company.

The Division will be located at 205 East 42nd St., New York 17, N. Y.

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Neville Co. Builds Warehouse Facilities in N. J. and Canada

The Neville Company, Pittsburgh, Pa., has established warehouse facilities at South Kearny, New Jersey, and at Toronto and Montreal, Canada.

These new warehouses augment the firm's facilities at Los Angeles and San Francisco, California.

ANSON B. NIXON

Anson B. Nixon Named Chairman Of Hercules Powder Co. Board

Anson B. Nixon, vice president of the Hercules Powder Company since 1940, has been elected chairman of the board, succeeding Charles A. Higgens who resigned from the position June 24.

Mr. Nixon, who resigned his vice-presidency to accept the new post, joined Hercules in 1915 as a chemist at the firm's Kenvil, N. J., plant. He has served as general manager of both the Hercules Cellulose Products Department and the Naval Stores Department.

Mr. Nixon was named a member of the board of directors in 1932.

The retiring chairman of the board, Mr. Higgens, remains a member of the board, and Hercules' finance committee.

•

Devoe & Raynolds To Triple Their Production of Devran

Facilities to triple the production of Devran, a new resin patented by Devoe & Raynolds Company, Inc., are under construction and will be in production this autumn.

According to Devoe chemists, Devran is strong, resists acids and alkali, and has good powers of flexibility and adhesion.

Devran maintenance finishes are said to be suitable for use in industrial plants where painted surfaces are attacked by film-destroying fumes and liquids, creating problems not solved by conventional finishes.

N. Y. University To Repeat Courses in Surface Technology

The Graduate Division, College of Engineering, New York University, will again offer several advanced courses in Surfaces Finishes during the 1953-1954 academic year.

They are Ch.E. 174, Surface Finishes, which will meet on Friday evenings at the Washington Square, New York, N. Y., branch, and Ch.E. 176, Surface Finishes Laboratory, which will meet on Monday evenings at the University Heights branch.

Registration for the courses, which will begin the week of September 21, 1953, will be held September 16-18, from 6:30 to 8:30 p.m., in Room 104, South Hall, at University Heights.

Both courses will be presented by Dr. Max Kronstein, Adjunct Professor, and Associate, Research Division, College of Engineering.

The course may be credited toward higher degrees by qualified students. Bulletins may be obtained by writing to Assistant Dean, Graduate Division, College of Engineering, New York University, University Heights 53, N. Y.

Basic Course

Two surface technology courses for persons working in the field of finishes will be offered during the fall term at New York University's Division of General Education.

The first course, *Fundamentals of Paint, Varnish, and Lacquer Technology* will be given at the University's Washington Square Center on Wednesday evenings, 8:10 p.m. from September 23 to January 20. Instructors will be Elias Singer, technical director for the Troy Chemical Company, and Myron A. Coler, consulting engineer and technical director for the Markite Company.

A basic course, it will cover such topics as coatings for protection, decoration, and functional purposes; raw materials used in organic coating; protection of construction materials; manufacture of organic finishes; testing methods; and finishers from the user's standpoint.

Seminar

A seminar on new developments in organic finishes will be given from 8:10 to 9:55 p.m. on Tuesdays, September 22 to January 19, also at Washington Square. Sidney Lauren, chief chemist for the C. J. Osborn Company, Linden, N. J., will join Mr. Singer and Mr. Coler in conducting the sessions.

Important advances made in the development of new and improved pigmentary materials and thinners and in application and curing techniques will be considered.

Synthetic Organic Pigment Sales Forecast Bright, Survey Reveals

Annual sales of synthetic organic pigments show promise of reaching a $600,000,000 volume by 1975 at 1950 prices, according to a survey of the chemical industry released by the Manufacturing Chemists' Association.

Estimated sales of synthetic organic pigments in 1952, at 1950 prices, were close to 400 million dollars, compared with 270 million dollars in 1950. In addition, the pigments were among 30 end-use chemicals each of which had sales of more than 20 million dollars in 1950.

The survey forecast steadily increasing pigment and solvent production from 1950 to 1962: pigment production increasing from 1,426,000,000 pounds to an estimated 2,100,000,000 pounds over the 12 year span; and solvent production climbing from 3,200 million pounds to 5,400 million pounds in the same comparative years.

In dollar terms, paint and allied products sold jumped from $573,237,000 in 1947, to $745,000,000 in 1951.

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Houdry Announces Availability Of Dehydrogenation Process

Availability of a Dehydrogenation Process, for the production of scarce aviation gasoline and synthetic rubber intermediates from low-cost materials, has been announced by the Houdry Process Corporation.

In the Houdry process, light paraffins are dehydrogenated of olefins and di-ole-fins by passage of preheated hydrocarbon vapors over catalysts of the chromic oxide-alumina type.

According to C. G. Kirkbride, president of Houdry, in addition to high conversion yields, the process does not require expensive special alloy equipment.

Among the more important applications of the Houdry process is the conversion of butane to butylenes and butadiene. Butylenes currently are in short supply because of the increasing competion between producers of rubber and aviation gasoline for the basic feedstock.

Butadiene, basic ingredient of general purpose (GR-S) synthetic rubber, was produced during the war in two government plants by the Houdry Dehydrogeneration Process. Rubber made from petroleum-based butadiene costs about half that of rubber produced from alcohol-based butadiene.

Government decontrol of rubber production coupled with the increasing demand for synthetic rubber, rubber-base paints, and synthetic fibers requiring butadiene, Mr. Kirbride feels, should stimulate the interest of private industry in the Houdry Dehydrogenation Process.

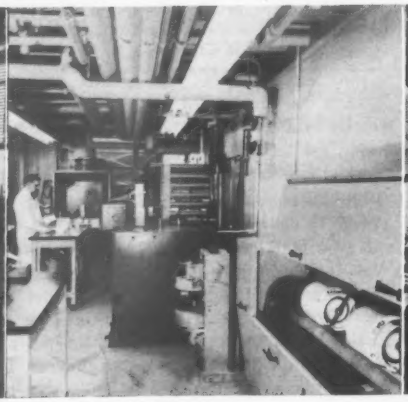
A Look Into The New Godfrey L. Cabot, Inc. Research Laboratories

Godfrey L. Cabot's new research laboratory located in Cambridge, Mass. on Research Row

Electron microscope laboratory." Magnification from 10-20,000X is attainable in this lab

Research in the field of high polymers is conducted in this fully equipped organic lab

Pigments application lab investigates and evaluates various Cabot products used in paints



Typical of the new laboratories established for testing new products is this Ceramic laboratory

Another section of the pigments application lab which evaluates Cabot's many products

Compounding lab compounds and evaluates over 2500 rubber and plastic stocks a year

Tests to meet individual customer preferences are conducted in physical testing laboratory

Specialized technical publications from fields of science and industry are stocked in library

A-D-M Launches Paint Selling Plan for Homeowners & Contractors

To promote more homeowner paint sales, the Archer-Daniels-Midland Company of Minneapolis, Minn., has readied a Week end Decorator Drive campaign. The plan will accompany another merchandising plan by A-D-M to boost sales for the painting contractor.

Both promotion ideals were presented by A-D-M in a series of 18 regional meetings of paint manufacturers, distributors and dealers held throughout the nation in recent weeks.

The consumer program and the painter-contractor plan have both been accepted with enthusiasm by some 200 paint manufacturers, several paint clubs, a dozen paint accessory manufacturers, jobbers and two dealer organizations, according to Thomas L. Daniels, A-D-M president.

August 30th has been set as "W-D Day" by sponsoring firms to confirm with publication of a full page advertisement scheduled for the September issue of a consumer magazine.

Participating dealers get a complete promotion package adaptable to any brand of paint or any kind of store. Banners and streamers for windows and walls are provided to dress up the Week-End Decorator headquarters and advertising aids in the form of newspaper mats and radio commercials are ready-made to entice customers.

Even the homeowner who buys the paint and accessories for a week-end of decorating will be a walking advertisement. Aprons, painters' caps and bandannas inscribed with such says as, "Whistle that bristle—Dream Boat" will be available, along with a 12-page booklet containing practical tips on painting.

The diversified array of merchandising material and consumer gimmicks all make up a copyrighted program which A-D-M has presented to the entire paint industry.

Finished artwork used in developing the program was offered to paint manufacturers and accessory makers for use in creating their own Week-End Decorator advertising program. To keep all the individual programs headed in the same direction, A-D-M requested that layouts be cleared through its merchandising department.

The painter segment of A-D-M's industry-wide program provides professional salesmanship training and

Array of merchandising material which makes up copyrighted program A-D-M has presented to the entire paint industry.

sales aids integrated with promotional ideas to win the contractor's share of the consumer's dollar.

A film slide and 24-page booklet on, "101 Sure Fire Ideas to Sell More Paint Jobs" will be available to contractors. Among the ideas listed are how to use office records to sell, how to use newspaper advertising and how to keep equipment clean.

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Chemical Engineering Scholarship Established by Sherwin-Williams

The Sherwin-Williams Company, Cleveland, Ohio, has established a scholarship in chemical engineering at the Illinois Institute of Technology.

Called the George A. Martin scholarship, honoring Sherwin-Williams' late president, the award will carry a $500 annual stipend.

Chemical engineering students who have completed three years of college work will be eligible for the award based on scholastic record, general ability and need for assistance.

Ralph G. Owens, dean of engineering at Illinois Tech, will designate the nominee for each scholarship who will then be passed by the Institute's scholarship committee.

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Mineral Pigments Corp. Opens Los Angeles Office & Warehouse

The Mineral Pigments Corporation, Muirkirk, Maryland, has announced the opening of their Los Angeles office and warehouse at 2225 E. 37th St., under the management of George Foos, formerly with C. K. Williams & Company.

Sales of the Pacific Coast and Rocky Mountain area and distribution of products from Los Angeles, San Francisco and Seattle warehouses will be handled from the new office.

Canada's Vegetable Oil Output Covered at Chem. Inst't. Meeting

The importance of vegetable oil seeds for oil products used in the paint and allied fields was stressed by J. C. Woodward of the Canada Department of Agriculture, Ottawa, addressing the Protective Coatings Division, Chemical Institute of Canada at the CIC's 36th Annual Conference held June 4-6, at the Prince Edward Hotel, Windsor, Ont.

Mr. Woodward said new developments in the synthetic paint field may mean that in the future the plant breeder should concentrate more on better yield and less on quality, as measured by iodine number. The Linolenic acid part of the oil, which is responsible for after-yellowing of paints and flavors reversion of edible oils, might be advantageously reduced if the plant breeders were to undertake this assignment on flax, he said.

Of the many annual oil producing plants available for introduction into Canada, the safflower has attracted the most interest, the speaker pointed out.

This plant is a heavy yielder of oil, and plans are now underway to grow enough seed in Alberta for a commercial test by a Canadian oil seed processor. The safflower oil, like sunflower oil, is low in linolenic acid and is easily adapted for use in edible oils. The protective coatings industry may be increasingly interested in these oils as sources of triglycerides where after-yellowing is a problem.

Dr. Woodward said the Canada Department of Agriculture contributes to oil seed production by aiding the industry through research on crop breeding, soil conditions and climatic conditions, and studies on cultivation and harvesting.

•

Improved Refrigerator Finishes Resist Grease, Survey Shows

A field survey of refrigerator finishes has been completed by the Du Pont industrial finishes divisions in New Orleans, and Miami, Florida, which reveals that resistance to greasy materials, such as butter, has improved threefold over the past ten years.

Softening and eventual failure of the finish where greasy substances were transferred from the housewife's hands to the enamel, especially around door handles, long was a primary problem.

Observations involving several hundred refrigerators in homes show that this is no longer serious. According to the Du Pont chemists making the survey, the firm's "Dulux" synthetic resin enamels remain virtually blisterfree even under the extremely humid conditions in the cities selected.

Dow Dealer Educational Program Designed to Aid in Proper Use Of Latex Paint Proves Successful

1 - Representative discusses latex story with dealer.

2 - Sample of styrene-butadiene emulsion, is shown to the dealer.

3 - Demonstrating how a latex emulsion forms a rubbery film.

4 - Dealer is shown inspecting the latex film properties.

5 - Informed dealer telling customer how to use latex paints.

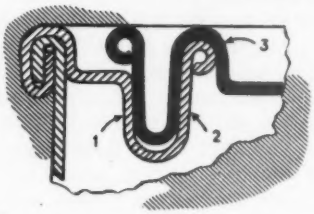
6 - Housewife redecorating with latex paints.

IT IS estimated that there are some 30 million amateur painters in the United States. With latex paints featuring ease of application, it would naturally follow that there would be considerable interest in these particular paints among homeowners, housewives and other amateur painters. Experts predict that the sale of latex paints will soar to 50 million gallons in 1953. This increase in latex paint sales is directly attributed to the "do-it-yourself" market which is grabbing off a significant share of interior paint sales.

However, the "do-it-yourself" market has pointed up the importance of educating the amateur painter on the proper application and use of new paint products. In this connection, the Dow Chemical Company has embarked on an educational program designed to acquaint the paint dealer with all aspects of latex paints. Among the subjects covered are a discussion of natural and synthetic latices and examples of each; a simplified description of the manufacture of synthetic latices; a demonstration showing how a latex emulsion will form a rubbery film; uses and special properties of latex emulsions paints. The informed dealer is then in the position to offer expert advice and assistance to his customers in the use of these new paints.

The accompanying photos show a Dow representative discussing the latex story with a paint dealer.

JUST SAY THE WORD!



"TRIPLETITE" lid binds metal to metal at three points—provides 50% better protection!

When you need cans in a hurry, just let Continental know. We'll really build a fire under your order and get the cans rolling to you—fast. Speedy delivery is one of the most important features of Continental's Tailor-Made Service.

And you get the best in containers, too. Our "Tripletite" paint cans provide a 50% increase in guard points against oxidation and formation of wasteful paint skin. As shown at the left, the metal lid binds at three points instead of the usual two.

Why not give Continental service a try? Call your nearest Continental office—see what it means to you!

CONTINENTAL CAN COMPANY

CONTINENTAL CAN BUILDING 100 East 42nd Street · New York 17, N. Y.

EASTERN DIVISION: 100 E. 42nd ST., NEW YORK 17

CENTRAL DIVISION: 135 SO. LA SALLE ST., CHICAGO 3

PACIFIC DIVISION: RUSS BUILDING, SAN FRANCISCO 4

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new and improved products. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.

BAKER-RAULANG

FORK TRUCK
4,000 lb. Capacity

Fork lift truck is said to provide fuel economy, smoothness of acceleration, ease of maintenance, safety and operator convenience. Equipped with transmission system that needs no clutch nor gear shift. Power system consists of variable voltage generator and an electric motor. Uses a gasoline engine. Known as "Gas-O-Matic". For more details write to The Baker-Raulang Co., Baker Industrial Truck Div., 1230 W. 80th St., Cleveland 2, Ohio.

REAGENT
Detects Traces of Water

Mois-Tec, a delicate reagent is used for rapid determination of traces of water in such products as solvents, plasticizers, higher alcohols, petroleum products, vegetable oils, fats, and waxes. It is claimed that traces of water can also be quickly determined in organic solids that cannot be heated, provided they are soluble in butyl alcohol. It will not work with glycerine, acetone, ethylene or propylene glycols, methyl, ethyl, or isopropyl alcohols. For complete details write to R. P. Cargille Laboratories, Inc., 117 Liberty St., New York 6, N. Y.

STRAPPING MACHINE
Reduces Operator Fatigue

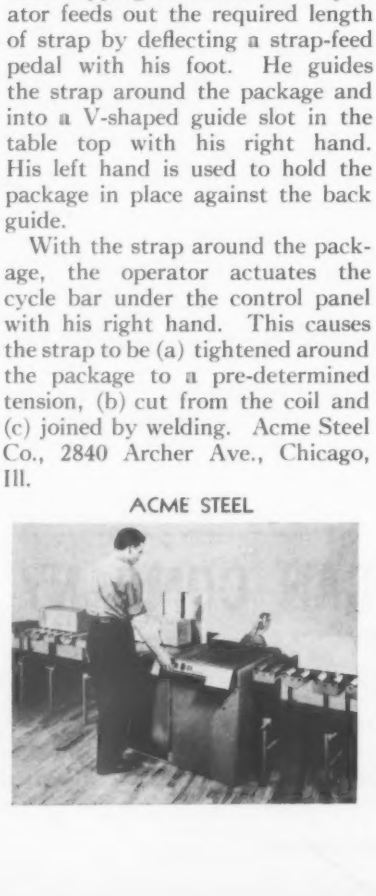
This strapping machine is designed to speed high volume flat steel strapping operations and to reduce operator fatigue, produces strapped joints by spot welding.

In operation, packages approach the machine on roller conveyors. Roller sections and ball transfer rollers mounted in the table top (see accompanying photograph) facilitate the handling of packages by permitting them to pass over the strapping mechanism or to be turned for cross-strapping with a minimum of effort.

With the package centered over the strapping mechanism, the operator feeds out the required length of strap by deflecting a strap-feed pedal with his foot. He guides the strap around the package and into a V-shaped guide slot in the table top with his right hand. His left hand is used to hold the package in place against the back guide.

With the strap around the package, the operator actuates the cycle bar under the control panel with his right hand. This causes the strap to be (a) tightened around the package to a pre-determined tension, (b) cut from the coil and (c) joined by welding. Acme Steel Co., 2840 Archer Ave., Chicago, Ill.

ACME STEEL



FATTY ACIDS
For Alkyd Finishes

These two new fatty acids are available to vehicle manufacturers and have special interest in alkyd finishes:

Neo-Fat 125 is said to be a new, heat stable, light colored unsaturated-type of fatty acid. Its color heat stability is reflected through all stages—storage, heat processing, finished alkyd and exposure upon application. According to the manufacturer, this particular fatty acid assures alkyd processors of faster, more uniform cooking time because each lot of fatty acid produced must conform to rigid quality control specifications. Hence, the complete performance characteristics of this fatty acid remain consistent from one shipment to the next. Neo-Fat 125 is adapted for the manufacture of long-oil alkyds.

Neo-Fat 280 with a low unsaturated fatty acid content (less than 1%) is said to offer to alkyd manufacturers every property necessary for quality high-bake enamels. It makes available pale, uniform alkyds used in premium white and pastel non-yellowing finishes. When properly formulated, applied and baked, this fatty acid provides good non-yellowing properties. Test have shown that Neo-Fat 280 alkyds modified with urea or melamine resins exhibit good heat and light stability; they have strong, hard chemical resistant films that are tough and flexible and will not embrittle or "check" upon aging. Such properties make for enamels used in the protection of household appliances such as refrigerators, stoves, cabinets and venetian blinds. According to the manufacturer, alkyds made from this fatty acid show good resistance to greases, oils, soaps, solvents, and other similar chemicals.

Armour Chemical Div., 135 W. 31st St., Chicago 9, Ill.

NEW MATERIALS — EQUIPMENT

SILICA GEL
Stops Gas in Metallics

Syloid AL-1, a new type of silica gel is said to prevent the formation of hydrogen gas in metallic paints. According to the manufacturer, gas is formed by the reaction of moisture with aluminum, gold pigment and other finely divided metallic particles. Bulging of the lid of the container and leakage of the paint frequently is caused by gas and is a serious source of loss under shelf storage conditions. Tests show that this silica gel, added to aluminum paint in small quantities, absorbs the water before any reaction can take place. For complete information on this additive, write to The Davison Chemical Co., Baltimore 3, Md.

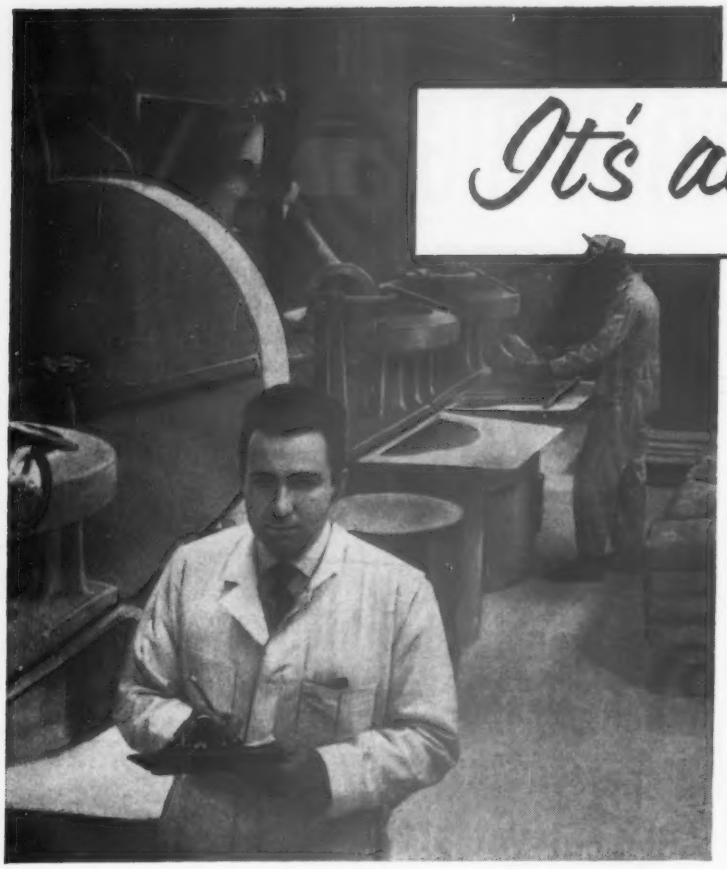
TRIHYDRIC ALCOHOL
For Alkyd Synthesis

Trimethylol ethane (TME) is a trihydric alcohol recommended in the synthesis of alkyd resins. This polyol contains all primary hydroxyl groups—a factor, which according to the manufacturer speeds up the alkyd manufacturing process and gives greater stability and durability to the paint formulated from the alkyd. It was also pointed out that TME has special importance in alkyd resin formulations where viscosity and handling properties are of major importance. Heyden Chemical Corp., 342 Madison Ave., New York 17, N.Y.

SURFACE ACTIVE AGENT
For Latex Emulsions

Water dispersible lecithin compound aids pigment dispersion and prevents foaming in latex emulsion paints, according to the manufacturer. Other features reported are: aids brushing and leveling, prevents caking of pigment, improves adhesion, acts as an antioxidant preventing hardening of dried film, improves compatibility of oils, oleoresinous varnishes and alkyds with basic latices. This compound known as Clearate WD is available from Naftone, Inc., 515 Madison Ave., New York 22, N. Y.

YOUR BIG NEWS IN PIGMENTS...WILLIAMS NEW KROMA RED!
Gives you far brighter mass color, much cleaner tint, is more easily dispersed than any red iron oxide pigment yet produced!
MEANS THAT YOU CAN NOW USE A LOW COST IRON OXIDE PIGMENT FOR WORK WHERE MORE BRILLIANT COLORS ARE REQUIRED FROM LIGHT RED TO DEEP MAROON
Chemical and Physical Properties
Fe_2O_3 95.0% MIN.
Sp.G. 4.80
Oil ABS. 21-22
Hiding SQ. FT. per LB. 850-1,000
KROMA RED applications:
Toy and furniture enamels
House and barn paints
Floor enamels
Resin and latex emulsion paints
Automotive finishes
Camouflage (high infrared reflectance)
Rubber products
Plastics
Textile finishes
Floor coverings
Building materials
Cement products
Leather finishes
Paper
. . . and many other uses.
WILLIAMS
COLORS & PIGMENTS
108 SHADES AND TYPES OF IRON OXIDE PIGMENTS



It's adaptable...

...that's why

Dutch Boy* **Basic Silicate White Lead "45X"**

is the factory manager's favorite

In exterior paint formulation, you can use "Dutch Boy" Basic Silicate White Lead "45X" to advantage to perform different functions.

It is this adaptability, plus economy, that makes "45X" the factory manager's favorite . . . as well as the paint maker's and the factory chemist's.

Use "45X" in white House Paints, for example, and you improve self-cleaning properties. Its wetting ability allows the rain to spread over the painted surface, thus giving it a better chance to wash off the dirt.

Use "45X" in tinted House Paints, and it helps make the film more durable, more resistant to color change. Also, because of its hydrophilic properties, "45X" promotes dirt removal and helps keep colors fresh and clean.

Use adaptable "45X" in Primers, and you get the lead soaps that increase adhesion. *And* the water resistance needed to maintain the paint film's adhesive bond which helps prevent peeling.

Use "45X" in Porch and Floor Enamels, and it plasticizes the film . . . increasing abrasion resistance. More than that, it forms lead soaps that contribute to the flexibility and water resistance of the film, and thus improve adhesion.

As its wide use by leading paint makers proves, "Dutch Boy" Basic Silicate White Lead "45X" is "lead" at its adaptable, economical best. Try it yourself.

More economical, too!

In adaptable "Dutch Boy" Basic Silicate White Lead "45X," the reactive portion of each pigment particle is concentrated at the surface. This makes available proportionately larger amounts of "lead." So you use fewer pounds than with other white lead types.

National Lead Company: New York 6; Atlanta; Buffalo 3; Chicago 8; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.).

*Reg. U. S. Pat. Off.

NEW MATERIALS — EQUIPMENT

SHAND & JUR

TANK GAGING
Automatic

Remote automatic tank gaging is now possible no matter what the distance is between the gaging station and the tanks being gaged (few miles or thousands of miles), according to the manufacturer. The gaging is based on electrical impulses to transmit level measurement, which is known as the S. & J. Varioplex system. It is said that figures on either standing or transient storage can be obtained in less than one-half a minute, and measurements can be taken day or night and during all types of weather conditions. Applicable in the chemical, paint and varnish processing, etc. For complete details on this system, contact Shand and Jur Co., 8th and Carlton Streets, Berkeley, Calif.

STYRENE EMULSION
May Be Blended with GRS

Fifty percent "Lustrex" stryene emulsion can be blended with GRS-2002 styrene-butadiene emulsion, according to the manufacturer. "Lustrex Latex 601-50 is said to be suitable for use in post-plasticized systems in which it can be substituted on a solids basis for other latices containing less emulsified styrene. May be used to formulate both interior and exterior paint systems as well as other types of surface coatings. Monsanto Chemical Co., Plastics Div., Springfield 2, Mass.

ALUMINUM PASTE
Improved Dispersibility

MD-515 is a high-pigment-volume aluminum paste which is reported to retain itself in suspension longer, has greater leafing rate, and disperses more easily. Meets Federal Specification TT-A-468a Type II Class B and ASTM Specification D 962-49 Type II Class B. For formulating stable ready-mixed aluminum paints. Metals Disintegrating Co., Elizabeth, N. J.

VINYL POLYMER
Soluble In Aromatics

Vinalak 300, a vinyl polymer, is said to be completely soluble in aromatic hydrocarbons resulting in low viscosity at high solids. Uses include the formulation of coatings for concrete, stucco, brick, and plastered surfaces. Has good resistance to alkalis, water, abrasion, acid, and weathering, according to the claims of the manufacturer. An increase in the molecular weight occurs during the drying process and results in a film which is no longer soluble in aromatic hydrocarbons. This factor produces paints which minimize lifting by subsequent coats and improves resistance to gasoline. High gloss paints can be obtained by grinding in conventional paint equipment. Reichhold Chemicals, Inc., 630 Fifth Ave., New York 20, N. Y.

NOW You Can Stop Pressure Build-Up in Aluminum Paints With SYLOID® AL-1

Tests conducted by the Aluminum Research Laboratories of Aluminum Company of America ". . . indicate that SYLOID AL-1, when used in concentrations up to 1% based on total weight of paint, effectively retards pressure development in ready-mixed varnish base aluminum paint containing moisture in concentrations up to 0.5%."

This problem of pressure build-up in ready-mixed aluminum paints has long been a serious one. Now this pressure development can be stopped. The leaf stability of the paint is not affected and the drying rate is not retarded.

For complete information on SYLOID AL-1, including results reported by Aluminum Research Laboratories, write

Progress through Chemistry

THE DAVISON CHEMICAL CORPORATION

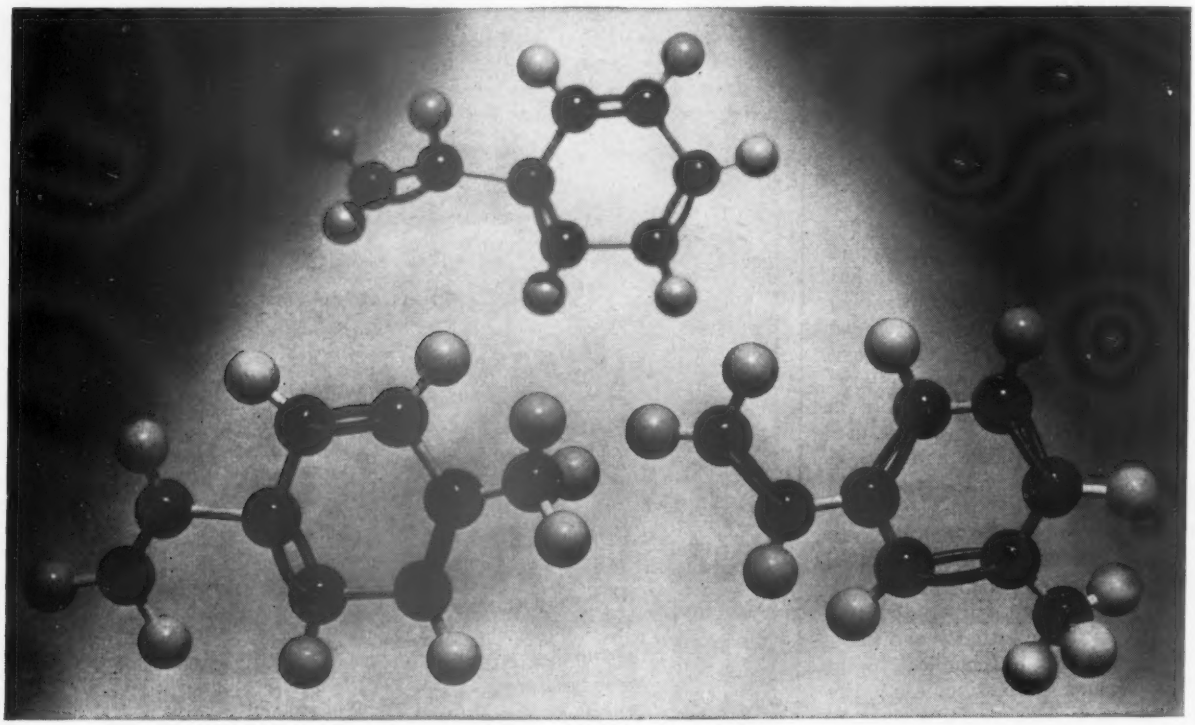
Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO® GRANULATED FERTILIZERS.

DOW

THE COMPARATIVE PROPERTIES OF STYRENE AND VINYLTOLUENE

DOW vinyltoluene produced as a meta-para mixture exhibits properties of interest to makers of paint vehicles, synthetic resins and rubber



PROPERTY	Vinyl-toluene	Styrene N-99	Vinyltoluene Difference
Molecular weight	118.	104.	Higher
Monomer sp. gr. 25/25°C.	0.890	0.904	Lower
Polymer sp. gr. 25/25°C.	1.027	1.050	Lower
Monomer refractive index, @ 35°C.	1.5342	1.5439	Lower
Polymer refractive index, @ 35°C.	1.581	1.590	Lower
Boiling point, °C. @ 760 mm.	170-171	145	Higher
Flash point, °C.	60	31	Higher
Freezing point, °C.	−82.5	−30.6	Lower
Shrinkage on polymerizing, %	13.35	13.85	Lower
Purity, %	99.0	99.5	Mixed isomers

For further information concerning Dow vinyltoluene, write THE DOW CHEMICAL COMPANY, Coatings Technical Service, Midland, Michigan.

you can depend on DOW PLASTICS

DOW

Personnel Changes

R. C. Boggess

R. L. Beyer

R. E. James

T. J. Gould

S. C. Murray

SPENCER KELLOGG

Robert L. Beyer has been appointed general sales manager. He succeeds **Robert C. Boggess** who has retired. Mr. Beyer joined the firm in 1935, serving most recently as sales manager of the Soybean, Coconut and Castor Oils Department. In 1951, he was appointed a member of the Industrial Oils Industry Advisory Committee to the Secretary of Agriculture, Washington, D. C. Mr. Beyer has also served on various committees of the Buffalo Paint, Varnish and Lacquer Association. Mr. Boggess joined Spencer Kellogg in 1916, becoming general sales manager in 1933.

Richard E. James has been named sales manager of the Linseed Oil Division, succeeding **Sydney C. Murray** who has retired. Mr. James joined the company in 1947 and most recently served as Manager of the Linseed Oil Meal Department. Mr. Murray joined Spencer Kellogg and Sons, Inc., in 1909 starting in the sales department. He was transferred to the Linseed Oil Department in 1915, becoming sales manager in 1933.

Thomas J. Gould has been appointed district sales manager in charge of the Baltimore territory succeeding **Herbert L. Bayer** who has been named district sales manager of the New York City office. Mr. Gould joined the firm in 1935 in the Purchasing Department. He was transferred to the Linseed Oil Division in 1949, as sales representative for the Buffalo District, a position he held until now. Mr. Gould has been active in the Buffalo Paint, Varnish and Lacquer Association.

BROWN-ALLEN

Robert A. Pollock, general manager of the oil division at Staten Island, N.Y., has been elected a vice-president.

T. J. E. Brown has resigned as vice-president and sales manager.

PITTSBURGH PLATE

Daniel P. Wedel, Milwaukee, Wis.; **Carl R. Faelten,** Newark, N.J.; and **John Bond,** Torrance, Calif., technical sales representatives, have been appointed district sales managers for Selectron Resin Products. The new district sales managers will continue to operate under the guidance of Dr. E. H. Haux, general sales manager.

HILTON-DAVIS

Ross M. Hastie has been elected divisional vice-president of Hilton-Davis Chemical, a division of Sterling Drug, Inc. He has been associated with the firm for 17 years. Most recently he was director of purchasing. Mr. Hastie also supervised sales of Hilton-Davis' organic intermediates to pigment and dyestuff manufacturers.

NEVILLE

Now Available **LX-782**

An Oxidizing Petroleum Resin

Rock-Bottom Price **7¢ lb.***

*in Drums F.O.B Neville Island, Pa.

Specifications

Melting Point (cube in mercury).....110-130° C
Color (Neville Color Scale).....9-13
Acid Number.....less than 1
Saponification Number.....0
Iodine Number.....130-160

Uses

Fast Drying Aluminum Paints
Drum Paints (other than light colored)
Porch and Deck Paints
Pipe Coating Oils
Metal Primers
Chassis Blacks

LX-782 is a low-cost, oxidizing, heat reactive hydrocarbon resin. Varnishes made by heat reacting LX-782 with drying oils at a temperature of about 550° F have these worthwhile characteristics . . . low cost, fast drying, good light stability, and excellent resistance to acids, alkalis, alcohols, gasoline, grease, water.

Write today for samples

THE NEVILLE COMPANY
PITTSBURGH 25, PA.

P-51

Plants at Neville Island, Pa., and Anaheim, Cal.

better say "Titanox®-C-50"

(rutile-calcium pigment; 50% TiO_2)

Finding the proper combination of white pigment and extender to produce the flat wall paint properties you want can be a tiresome task or it can be as easy as saying "TITANOX-C-50." In many cases, the proper combination of TITANOX-C-50 and extender will yield the sheen, hiding, washability and color uniformity you want.

TITANOX-C-50 provides desirable hiding at low cost for all paints in which higher titanium dioxide content than that of TITANOX-RCHT (30% TiO_2) is indicated. Like TITANOX-RCHT, TITANOX-C-50 is superior to ordinary mixtures of titanium dioxide and extenders in hiding power per dollar of pigment.

Consult our Technical Service Department for assistance with your paint formulation problems. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

® TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

1713

UNION CARBIDE

John D. Benedito has been appointed assistant general sales manager of the Bakelite Company, a division of Union Carbide and Carbon Corporation. Mr. Benedito joined Union Carbide in 1935. Prior to his present appointment, Mr. Benedito managed the molding and extrusion materials department. **Dr. R. H. Crist** has been named Director of Research, Physical Processes Department, Carbide and Carbon Chemicals Company, a division of Union Carbide and Carbon Corporation. Dr. Crist joined Carbide and Carbon in 1945 after having worked five years on the Manhattan Project.

J. D. Benedito

PUBLICKER INDUSTRIES

Arnold R. Beinstein has been appointed assistant to the president. He was formerly assistant general sales manager of the firm's chemical division. Mr. Beinstein has been associated with Publicker for the past eight years.

DU PONT

William Schuyler Colfax, Jr., has retired after spending 46 years with the firm. He joined the firm in 1907. For nearly the last 25 years Mr. Colfax has been associated with the Chicago sales office of Du Pont's Finishes Division, engaged in sales of automotive refinishes materials.

DOW CHEMICAL

Thomas M. Gow has been named supervisor of plastics sales for the Cleveland area. He was formerly assistant to the head of coatings sales section at Midland, Mich. Mr. Gow joined the New York City office as a coatings salesman in 1946 and moved to Midland two years later. **M. H. P. Morand** of the Chicago office will succeed Mr. Gow. Mr. Morand has been with Dow since 1949 when he joined coatings technical service at Midland. **William I. Wilson** has been appointed to the Chicago office as a coatings salesman, and **Jack C. Baumgartner** has been appointed to the St. Louis office in a similar capacity.

T. M. Gow

HERCULES POWDER

Philip A. Belk, of the firm's Advertising Department, has been named chairman of the public relations committee of the Society of the Plastics Industry.

Montgomery R. Budd has been appointed director of advertising for Hercules Powder. He succeeds Theodore Marvin who resigned to become president of the Michigan Chemical Corporation of St. Louis, Mich. Mr. Budd was named assistant manager of the advertising department in 1932.

SUN CHEMICAL

Alvin S. Baer has been appointed chairman of the firm's paint group. He had served as vice president and director of A. C. Horn Company, a Sun affiliate. Mr. Baer will continue to make his headquarters in Long Island City and will supervise the following companies: A. C. Horn Company; products finishing division of Hudson Paint & Varnish, Inc.; A. C. Horn Company, Ltd., and A. C. Horn Company of Texas.

E. W. COLLEDGE

Joseph B. de Bauernfeind has joined the home office staff of E. W. Colledge, GSA, Inc., Jacksonville, Fla., sales agents for the Naval Stores Division of The Glidden Company and the American Turpentine & Tar Company, New Orleans. Mr. de Bauernfeind was manager of Colledge's Detroit sales office until 1948 when he joined the S. S. Skelton Company, Cleveland. He became vice-president of that company prior to his move to Jacksonville.

from start to finish...

WITCO

Aluminum Stearates*

meet all your requirements

Secure the degree of flatting you want in your paints, lacquers or varnishes with one of these 3 Witco Aluminum Stearates:

Witco Aluminum Stearate	Flatting Efficiency	Properties
#132	Moderate flatting	High free fat, tri type soap with minimum gelling properties.
#16	Intermediate flatting	Fairly high free fat...will not gell too readily. Recommended for maximum wash resistance in dry films.
#18	Maximum flatting	Low free fat. This is the most efficient flatting agent of all Witco's aluminum stearates.

Witco's long experience in the manufacture of stearates, plus careful quality control, assure you of a uniform, dependable product. Write today for technical information, samples or assistance with your formulation.

*Made in Witco's plants in Brooklyn, N. Y. and Chicago, Ill.

WITCO CHEMICAL COMPANY

260 Madison Avenue, New York 16, N. Y.

LOS ANGELES · BOSTON · CHICAGO · HOUSTON · CLEVELAND

SAN FRANCISCO · AKRON · LONDON and MANCHESTER, ENGLAND

NATIONAL LEAD

William Knust, advertising manager since 1927 has retired. He is succeeded by **T. Howard Sarine,** formerly assistant advertising manager. **Edward A. Olson** becomes assistant advertising manager. Mr. Knust joined National Lead in 1909, working his way up through every division of the advertising department. Mr. Sarine joined the firm in 1923. He became assistant advertising manager in 1927. Mr. Olson started his career with the company in 1914 at the Carter White Lead Company plant in Chicago.

NATIONAL STARCH

John C. Clay, assistant administrator, National Production Authority, has completed his duties with the agency and is returning to his position as assistant to the executive vice-president of National Starch. He served with the NPA for 14 months. Mr. Clay will continue to serve as consultant to H. B. McCoy, acting NPA administrator.

CELANESE

William A. Shine and **P. Wenzell, Jr.,** have joined the firm's Development Department. The Department was recently established with E. T. Powers as director to study new technological developments here and abroad and to act as an instrument for long range planning. Mr. Shine most recently served as director of marketing development for Arnold, Hoffman and Company, Inc., American affiliate of Imperial Chemical Industries. Mr. Wenzell was formerly with the United States Bureau of Mines.

C. J. Kaiser

W. J. Houston

A. C. Brumberger

NUODEX

C. J. Kaiser has been appointed manager of Field Service. In addition to previous responsibilities, he will develop the activities of this new contact liaison service. Mr. Kaiser has been engaged in technical service work in the protective coatings industry for more than 25 years.

William James Houston has been named manager of paint industry sales. He joined the firm in 1946 and was most recently regional sales manager for the Eastern-Atlantic Seaboard.

Robert Clarke Brumberger has been appointed manager of chemical industry sales. Prior to his appointment, he was administrative assistant to the general sales manager. Mr. Brumberger joined the firm in 1951.

W. S. Rheem II

E. C. Bergen

RHEEM MFG.

W. S. Rheem II has been promoted from Western Division manager to assistant general manager. Mr. Rheem joined the firm 15 years ago. **E. C. Bergen,** who had been regional manager of Rheem plants in the Richmond, California area, becomes the new Western Division manager. He joined the firm in 1937, becoming successively plant engineer, and production, plant and regional manager.

A new
pigment milling
and grinding aid
for the Paint Industry
TENLO-70
That's what the man said...
"We gave it a real test! We have a stand-by mill that's in poor shape and awaiting an overhaul. We had to press it into emergency service and we were having trouble getting a grind better than 4½.
"We added 2% Tenlo on the pigment weight. Our grind went up to 6½; grinding time was cut in half."
Old mills or new, Tenlo-70 will save you time and money.
Get that sample off your shelf and use it today.
PROPERTIES OF TENLO-70
Color—Amber • Form—Liquid
Pounds per gallon—8.23
Active Material—100%
GRIFFIN CHEMICAL COMPANY
1000 16th STREET SAN FRANCISCO 7 CALIFORNIA
Los Angeles Plant Richmond California

4 GIVE YOU MORE

when you call for

Marbon "9200"

Soluble High Styrene Paint Resin and Paint Chips

Four Different Viscosity Grades Give You Easier, More Flexible Paint Formulations

Enjoy greater freedom in the use of reactive pigments and obtain controlled viscosity without pigment changes. The chemical inertness of the "9200" resins, along with the high film build of the LLV formulations, make them perfect for use in maintenance and anti-corrosion coatings.

Use MARBON 9200 HV for low vehicle solids at higher viscosity.
Use MARBON 9200 MV and LV for general use.
Use MARBON 9200 LLV for high vehicle solids at lower viscosity.

GET THE FACTS — *Write* TODAY FOR TECHNICAL LITERATURE

Marbon

MARBON CORP.

GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

MARBON . . . Your Buy-Word for Product Perfection

AMERICAN CYANAMID

R. A. Hoekelman has been appointed general manager of the Plastics and Resins Division. He was formerly assistant general manager. Mr. Hoekelman is succeeded as assistant general manager, by **Dr. L. P. Moore,** formerly director of the Development Division of the company's Stamford Research Laboratories.

Other appointments within the division sales manager, **H. B. Freeman** as technical director, and **W. F. Whitescarver** as assistant division sales manager.

DIAMOND ALKALI

William B. Beeson, Jr. has been named sales manager of Diamond Alkali's new subsidiary, Belle Alkali Company, of Belle, W. Va. He will be located in Cleveland. Mr. Beeson joined the company in 1933. Most recently he served as assistant branch manager at Diamond's Pittsburgh office.

Fred W. Fraley has retired as vice-president. He recently resigned as a director of the company. Mr. Fraley's 25-year career with Diamond began in 1928 as Manager of Diamond's Southwest Sales Office in Houston, Texas. He was named vice-president in 1946.

SHIELD CHEMICAL

Frank J. Emerson, formerly of Spray-Insulation, Newark, N. J., has joined the firm at Verona, N. J., as sales engineer. He will handle company sales on Drycrete and Masticote waterproofing

TITANIUM PIGMENT

Earl W. Diener has been named eastern sales manager of National Lead Company's Titanium Pigment Corporation. Mr. Diener joined the firm in 1937 as a Titanium Pigment salesman in the Philadelphia territory. In 1943 he was placed in charge of the New England territory and in 1950, was appointed a district sales manager, which position he held until the present appointment. **John A. Southworth** has been appointed assistant trade sales manager. Most recently he was trade sales supervisor of the National Lead Company of Massachusetts.

E. W. Diener

G-E

Richard A. Steenrod has been named silicone sales representative at Cincinnati. He joined G-E in 1949 as a member of the chemical and metallurgical training program. After completing the course, Mr. Steenrod held various silicone engineering and marketing positions at Waterford, N.Y.

Fred M. Pugh has been appointed sales representative for the firm's silicone products department to industries in central and eastern Ohio. He will make his headquarters at G-E's Chemical Division office at 1105 Chester Ave., Cleveland. Mr. Pugh was formerly a silicone sales representative in Cincinnati.

GENERAL MILLS

Abner C. Hopkins, Jr., has been appointed director of chemical sales for the Chemical Division. He was formerly director of Commercial Chemical Development at the General Mills research laboratories in Minneapolis, a position he held since joining the company a year ago. He will eventually establish his office at the firm's chemoil plant in Kankakee, Ill.

SHARPLES CORP.

Fred W. Stakelbeck has been elected a member of the Board of Directors. He was elected vice-president in charge of production in 1950.

RINSHED-MASON

Arthur L. Hoffman has been appointed sales representative. He will sell in the Wisconsin area where he has over nine years experience with industrial and automotive type paint finishes.

Approved—

FOR LATEX and EMULSION PAINTS

A SURFACE ACTIVE COLLOID WITH A TRIPLE EFFECT

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PATENTS

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Ultrasonic Dispersion

U. S. Patent 2,637,535. Michael Henry Miller Arnold, Birmingham, England, assignor to Postans Limited, Birmingham England, a corporation of Great Britain.

The new or improved process for manufacturing paints comprising the steps of effecting the admixture of a powdered pigment and a carrier liquid of low viscosity, subjecting the mixture to ultrasonic vibrations to ensure a uniform dispersion of the pigment in the carrier liquid, reducing the product to a desired solids content by evaporation, then adding the preparation aforesaid in the required proportion to a liquid which is to constitute the body of the paint and which liquid is of relatively high viscosity, and subsequently effecting a mixture of the liquid pigment preparation of relatively low viscosity and the liquid of relatively high viscosity.

Siloxane Compositions

U. S. Patent 2,637,719. John E. Dereich, Painesville, Ohio, assignor to Diamond Alkali Company, Cleveland, Ohio, a corporation of Delaware

The method which includes the steps of combining a compound of the general formula $RSi(OY)_nU_{3-n}$, wherein R is selected from the group consisting of alkyl, aryl, alkaryl, and aralkyl radicals, Y is selected from the group consisting of primary alkyl, aryl, alkaryl, and aralkyl radicals, X is halogen, and n is an integer from 1 to 2, inclusive, with a hydrolyzate of a compound of the general formula $R'R''SiU_2$, wherein R' and R'' are selected from the group consisting of alkyl, aryl, alkaryl, and aralkyl radicals, and X is halogen, and reacting the mixture thus obtained with a strong dehydrating mineral acid in the substantial absence of water.

Mar-Resistant Paint

U. S. Patent 2,640,038. Edward A. Wilder and Francis E. Chapman, Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

A mar-resistant paint composition comprising pigment and vehicle, said vehicle consisting essentially of an organic solvent, a resin and an ester of a polyhydric alcohol selected from the group consisting of pentaerythritol, polypentaerythritol and mixtures thereof, at least partially esterified exclusively with a monocarboxylic saturated fatty acid having from 15 to 22 carbon atoms, said ester being soluble in said resin and forming a physical solution therewith and being present in a quantity within a range of from an amount sufficient to increase the contact angle of water with material treated with said composition 20° over that treated with a quantity of said composition not containing said ester, the upper limit of said range being 4% by weight of the total composition.

Pentaerythritol Soya Alkyd

U. S. Patent 2,637,708. Paul E. Marling and August R. Hempel, Dayton, Ohio, assignors to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

In the process of producing a degummed soybean oil-modified alkyd resin the step consisting of the reaction of pentaerythritol and degummed soy-

SOLVENTS

acetone
n-butyl acetate
ethyl acetate
2-ethylbutyl alcohol
2-ethylhexyl alcohol
isobutyl acetate
isobutyl alcohol
isopropyl acetate

PLASTICIZERS

dibutyl phthalate
diethyl phthalate
di-(2-ethylbutyl) phthalate
di-(2-ethylhexyl) phthalate (DOP)
di-(methoxyethyl) phthalate
dimethyl phthalate
di-2-ethylhexyl adipate
di-isobutyl phthalate

ANTI-SKINNING AGENTS

Tecquinol
mono-tert-butyl hydroquinone
Tenamene 20

FILM FORMERS

cellulose acetate
cellulose acetate butyrate

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bean oil at a temperature above about 450° F. for at least about 10 minutes prior to the introduction of the oil-soluble alcoholysis catalyst, then adding the said catalyst and continuing the alcoholysis until a clear solubility at room temperature of at least 2.5 parts by volume of methyl alcohol per part by volume of product is obtained, then esterifying the resulting product by adding a dicarboxylic acid anhydride until the acid value is reduced below about 15.

Melamine Composition With Filler

U. S. Patent 2,639,277. Andrew A. Varela, Old Greenwich, Conn., assignor to American Cyanamid Company, New York, N. Y., a corporation of Maine.

A resinous composition having diminished toxicity at decomposition temperatures consisting of from 35 to 45% by weight of a melamine-formaldehyde resin and from 65 to 55% by weight of a filler, respectively, based on the total weight of said composition; wherein said filler consists of from 10 to 20% by weight of china clay and from 90 to 80% by weight of glass fibers, respectively, based on the total weight of the filler.

Oil Modified Alkyd

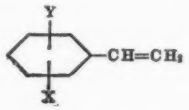
U. S. Patent 2,637,707. Paul E. Marling and August R. Hempel, Dayton, Ohio, assignors to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

The process of preparing a clear oil-modified alkyd resin comprising the alcoholysis of degummed soybean oil with monopentaerythritol in the presence of an alcoholysis catalyst until the methyl alcohol test shows the solubility of 1 part of product to at least 2.5 parts of methyl alcohol at room temperature, then esterifying the resulting product with a dicarboxylic acid anhydride selected from the group consisting of phthalic anhydride and a mixture of phthalic anhydride and maleic anhydride wherein the latter does not exceed 5 per cent by weight of the former.

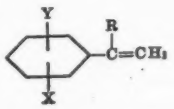
Styrene Drying Oil Interpolymer

U. S. Patent 2,639,272. Gerald A. Griess and Arthur S. Teot, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware.

A process for making a toluene-soluble interpolymer of a monovinyl aromatic compound, an alpha-methylene alkyl aromatic compound and a drying oil fatty acid, which comprises interpolymerizing from 10 to 90 parts by weight of a drying oil fatty acid and from 90 to 10 parts of a mixture consisting of from 50 to 85 per cent by weight of a monovinyl aromatic compound having the formula:



and from 50 to 15 percent of an alpha-methylene alkyl aromatic compound having the formula:



in which formulas X and Y each represents a member of the group consisting of hydrogen and lower alkyl radicals containing not more than three carbon atoms and R is an alkyl radical containing not more than two carbon atoms, by heating the mixture of polymerizable materials at temperatures between 120° and 300° C.

SOMEWHERE in Southern France, before the last Ice Age, one of our Stone Age ancestors sat by the fire in his cave dwelling. He was warm and, having just dined on roast bison, he felt good. Reflectively chewing on a charred bone to get at the marrow, he dreamily contemplated the buttery black paste—a mixture of burnt bone and fat—which so stubbornly clung to his hands. Seized by a sudden emotional impulse, he stepped to the nearest wall of his cave and drew a few tentative lines on the flat rock surface with his finger. The pigment he utilized—bone black—is employed by the paint industry to this day. Since the basic desires of our Paleolithic artist were centered on food—a dire necessity in the case of a nomadic hunting people retreating before the encroaching ice sheets—his initial aesthetic creative efforts eventually evolved into the outlines of animals he hunted for food.

None of these drawings had durability, of course. But some fine specimens were found in the Dordogne district of France where landslides, probably at the end of the last Ice Age, had hidden the cave dwellings of Cro-Magnon men for thousands of years. The first recorded evidence of the use of paint was thus preserved.

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Paint is used for one or more of four purposes: for *decoration*, for the *protection* of structural materials, for *sanitation*, and for obtaining better *distribution of light or greater visibility* of an object. These functions of paint were discovered in the order named, and all of these will be treated in succeeding advertisements.

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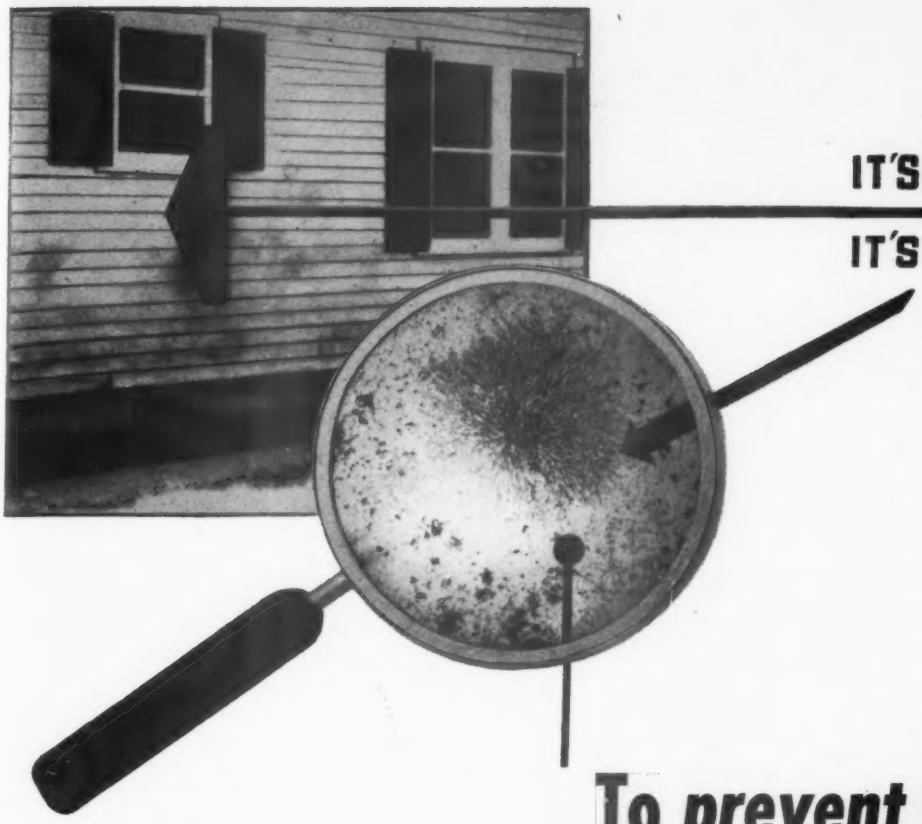

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*City*_____ *State*_____

WOOD FINISHING

(*From page 30*)

needless waste of solvent in the low solids lacquer. Low viscosity nitro-cottons in combination with ester gum and a variety of short oil alkyds, are now largely used. Solid contents of 30-40% are now quite common as against the older lacquers with 20-25% solids. The nominal price is higher, but there is no doubt of the greater economy obtained in use. In short, when actual mileage is considered high solid lacquers are always cheaper.

The solvents used by lacquer manufacturers today, are undergoing significant changes. The completion of the Shell plant at Stanlow, Cheshire[6] has marked the beginning of an interesting struggle. This struggle is between solvent based on the fermentation of molasses and those based on the cracking of heavy fuel oils or petroleum residues. Six years ago, the writer investigated lacquers based on methyl iso-butyl carbonal and methyl iso-butyl ketone in lieu of butyl acetate and butyl alcohol. He was then firmly of the opinion that such lacquers were fully equal in application properties and showed greater economy in use[7]. Subject to adequate supplies being available, the question definitely resolves itself into the simple one of price. Butyl acetate and butyl alcohol will have to be cheaper than methyl isobutyl carbonol and methyl isobutyl ketone if they are to maintain even a partial hold on the lacquer industry in Great Britain.

There have been no significant changes in the type of spray color solution or in matte lacquers and matting solutions. Spray colors are still largely dilute solutions of spirit soluble dyes, bound in shellac or nitro-cotton. Matting lacquers and solutions are still based mainly on low resin nitrocotton with stearate or synthetic waxes or colloidal silica as matting agents.

Styrenated and short oil alkyds have been creeping into the fields of cellulose pigmented enamels for kitchen cabinets and nursery furniture etc.

In general, it can be maintained that the way to radical improvement in the wood finishing industry is still interconnected with forced drying or low temperature baking as a primary measure. Once this is undertaken, the field is thrown open to the multitude of low temperature thermo-setting resins which are constantly appearing.[8]

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8. B. M. Letsky, "Paint Manufacture", Dec. 1948

*Director of Industrial Finishes Development, Ault & Wiberg Group, London England.

Anxious to avoid the need for a large inventory, the makers of this paint tested many solvents in order to find an *all-purpose* thinner. Of the many tried, Sun Spirits alone was able to maintain uniform quality. They have used it exclusively now for 22 years with complete satisfaction.

The owners of this plant used a solvent that often gave varnishes a dark cast or caused them to gum. Changing to Sun Spirits 11 years ago solved the problem. Largely due to the greater uniformity of this Sun product, the varnishes have gained in reputation since its adoption.

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Sun Spirits is a carefully balanced product. It has good wetting-out power. Volatility is controlled to insure a rate of drying that is neither too fast nor too slow. Purity is constantly checked and rechecked to make certain of a reliable, high-quality product. In new formulas as well as old, and in experimenting with new materials, you can rely on the uniformity and quality of Sun Spirits. For full information, or the counsel of an experienced representative, just call your nearest Sun Oil Company Office.

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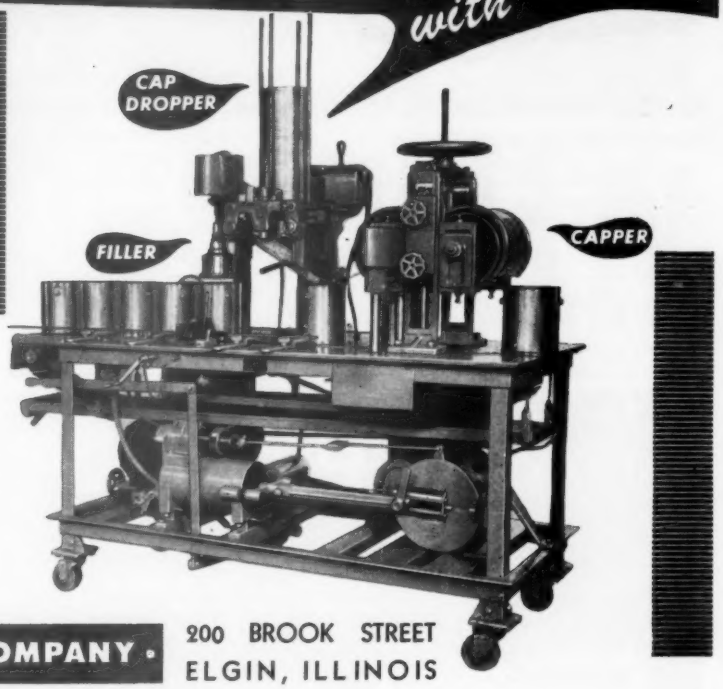

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MASONRY COATINGS

(*From page 33*)

thoroughly for dampness. If this condition exists it would be unwise to use an oil base coating.

Bituminous Coatings—Bituminous coatings are highly resistant to the chemical attack of cement, but due to their color, are very seldom used above ground. Their main forte is for below or under ground foundation waterproofing where they have no peer. For above ground they are available in drab colors suitable only for industrial plants.

Transparent Coatings

Transparent coatings are finishes lacking in opacity. They are principally used on limestone, brick and other surfaces where the original color of the surface is desired.

The most prominent types of transparent membrane coatings are:

The Stearate Based Type—This coating is usually composed of aluminum stearate dispersed in a suitable solvent. The excellent water insolubility and repellency of this chemical is used to advantage. The stearate particles line the walls of the millions of pores or capillaries existing in the masonry surface, thus materially retarding the entrance of moisture. In this manner the wall is protected from moisture without physically affecting the appearance of the surface.

Silicone Based Type—The latest type of transparent waterproofing to come into prominence is the silicone based product. The silicones possess a lower surface tension than many other product used for the same purpose. Because this property they are readily able t penetrate the very small capillari existing in a wall. This is effected with out sealing the pores so that any moisture contained within the wall will hav an opportunity to escape without injuring the coating.

The following advantages can b attributed to the above transparen coatings: (1) Retardation of efflores cence; Since efflorescence is impossibl without the presence of water, it is re tarded when the treated surface pre vents the entrance of the moisture (2) The silicone coating can be applied at freezing temperatures. (3) The masonry is allowed to "breathe." (4) Good penetration of the coating into the wall this is especially true of the silicone product due to its low surface tension Because of this deep penetration, weathering action can only influence the outer layers of the wall, the inner layers being protected. (5) The appearance of the wall is not materially altered. (6) Minimizing the flaking and peeling of interior and exterior paints.

Since the entrance of water is greatly reduced it cannot penetrate to the interior thus pushing the paint from the wall; and in a similar but reversed manner exterior paints are protected from the condensation of steam on the inner walls. (7) Retards spalling and cracking of the wall; This destruction of masonry results from a constant and repetitious freezing and thawing of trapped moisture causing its contraction and expansion. Reduction of the content of moisture contained in the wall will increase the life of the masonry. (8) Reduces the accumulation of dirt and soot on the surface; Water is an excellent carrier of dirt and soot; if the water is repelled and cannot penetrate the wall, it naturally will result in less dirt adhering to the face of the wall.

Since varying conditions exist in masonry walls there is no coating that can be truly classified as satisfying all of them. Because of the existing variations, an examination of the wall by a competent inspector is advisable before selecting a coating. In this manner the proper coating is chosen that will insure the wall ample protection and long life.

•

General Mills Names Los Angeles Firm S. California Sales Agents

General Mills, Inc. has appointed the E. B. Taylor Company of Los Angeles sales representative to handle their Chemical Division's line of refined soybean oils and fatty acid products in the Southern California area.

Mr. Taylor is an active member and past president of the Los Angeles Paint Varnish & Lacquer Association.

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Also developed from "Superior" to meet the need for faster polymerization and lower acid values after cooking are SUPERIOR "C" and KEL-VI'-TOL.
Superior "C" contains a polymerization catalyst and can be bodied to a Z5 viscosity in two-thirds the time required for Superior.
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The First Name in Vegetable Oils

VEHICLE QUESTIONS

(*From page 27*)

circulating pump, in the boiling of cooling water at the external surface of the tubes, in drawing air into the pump suction and in the boiling of solvent under the reduced suction pressure. To reduce hammering from opening and closing of the internal pump bypass, it should be set to open at a pressure of approximately one-third of the discharge pressure at the cooler. A second approach is to set the bypass to open at a temperature far above pump discharge pressure and to control pressure by means of an external, hand-operated bypass in the pump discharge line. Noise from boiling of water at the external tube surface can be reduced by cooling with hot water which will boil uniformly. Hammering from air in the line can be reduced by installing a dome or accumulator in the discharge line. Hammering from the boiling up of solvent can be reduced by installing a dome in the suction side.

How can materials like phthalic anhydride be prevented from plugging condensers. Where horizontal pitched condensers are used, or where vapors are led into the top of vertical condensers, the vapor risers may be jacketed for the circulation of hot water under pressure, or low pressure steam. The condenser may be designed for cooling with the same media. Since the melting point of phthalic anhydride is approximately 298°F, it is possible to keep any such material that does come over in the molten state. A weekly boil out with caustic solution, circulated through all exposed parts also serves to clean accumulations away from parts which may plug.

The number of questions which are asked are manifold. The preceding few which have been discussed were selected on the basis of general applicability and frequency asked.

•

Celanese Increases Production of Propionic Acid and Butyric Acid

The Celanese Corporation of America has begun large-scale production of both propionic acid and butyric acid for sale to general industry.

Output is coming from the newly constructed special products unit at the Pampa, Texas, plant.

Propionic and butyric acid offer uses in modifications of cellulose plastics. Other uses of these acids are in surface coatings, lacquers, flavors and pharmaceuticals.

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SMOOTH "FLOW-OUT" OF PAINT
Uniformity of heat distribution and rapidity of solvent removal give smooth, even paint film.

THOROUGH UNIFORM BAKE
Near Infra-red energy penetrates paint film with constant uniform temperature.

CLEAN FINISH
No by-product of combustion — no condensation of solvent volatiles to mar finish.

SAFETY CONTROLLED
Instant heat shut-off with conveyor stoppage. No over-baking by shut-off lag.

STABLE PERFORMANCE
Unaffected by day-to-day weather conditions.

LOWEST BAKING COST

LOWEST OPERATING COST
Puts heat into the product — not into oven walls. Uses less fuel. Gold plated interior reduces heat loss to 2%. In many instances, Fostoria electric operation actually costs less than any other fuel.

REQUIRES LESS FLOOR SPACE
Shorter Cycles—most production for oven size. May be ceiling mounted.

FASTEST PRODUCTION
Fastest means of heat transfer. No warm-up required — no shut-off lag. Heat levels instantly changeable.

LOWEST MAINTENANCE COST
Clean operation — no combustion by-products. Lowest source replacement cost.

COMFORTABLE WORK CONDITIONS
No room ventilation problem.

COMPETITIVE INITIAL COST
Comparable to any quality-built oven.

Throughout industry, new high standards of efficiency are being set by utilization of modern Fostoria oven equipment. A Fostoria representative will gladly analyze your production needs and submit recommendations for your consideration.

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The new Roalox Mill Jar outwears the best conventional porcelain jars two to three times! Cuts jar replacement in ball and pebble milling two-thirds!—And costs but pennies more than ordinary mill jars!

New Roalox Mill Jars are made of a remarkable ceramic body closely related to Burundum (the high specific grinding medium) in both physical and chemical properties.

This new fortified body reduces silica contamination to a negligible point — not only because it wears far more slowly, but the silica content of the body itself is substantially less.

Combined with wear-resistance three times greater is far higher mechanical strength—breakage hazard is lessened—jar replacement further lowered.

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NO OTHER MILL JAR CAN OFFER SUCH A COMBINATION OF FEATURES

1. Two to three times greater wear life
2. Twice the mechanical strength
3. Easy, positive lid locking
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Roalox Mill Jars are made in 8 sizes: ½ pt., ⅓ gal., ½ gal., 1⅓ gal., 2⅓ gal., 3½ gal., 4½ gal., and 6½ gal. Write for Bulletin 270 for full details.

U. S. STONEWARE

Akron 9, Ohio

D-1 Committee on Paints Issues Yearly Report at ASTM Meeting

Committee D-1 on Paint, Varnish, Lacquer and Related Products issued its yearly report at the 56th Annual Meeting of the American Society for Testing Material held June 29-July 1, in Atlantic City.

At a general meeting which took place July 1, the Advisory Committee of D-1 approved the formation of a sub-committee on Latex and Emulsion Paints.

Committee D-1 members then received proposals on two rule changes for vote by letter ballot, to: 1. Admit non-members to sub-committees for a one year period, and 2. Withhold committee reports from publication until released by the chairman.

The D-1 general meeting concluded with reports from the various sub-committees.

•

Glidden Company Holds 3-Day General Research Conference

A group of 55 chemical experts from the paint and varnish, chemicals, pigments and metals, vegetable oils and soya products divisions of the Glidden Company, Cleveland, Ohio, attended a three-day general research conference recently at the firm's soya products division laboratory in Chicago.

Purpose of the conference, held under the chairmanship of Paul E. Sprague, vice president at Glidden, was to integrate all company research activities and coordinate plans for future development.

Featured speaker at the meeting was Dwight P. Joyce, Glidden president, who spoke on *The Challenge of Tomorrow.*

•

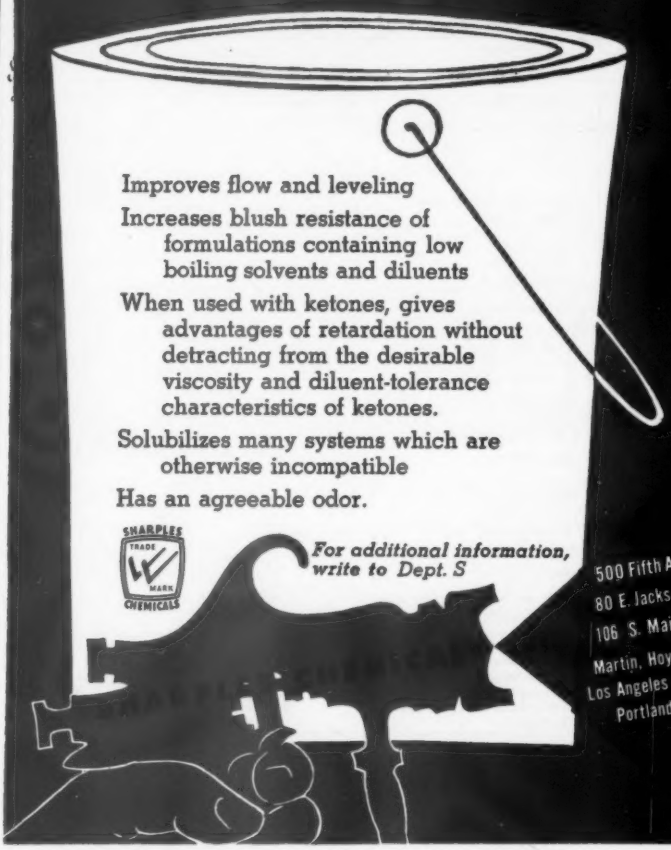
Masonry Constructed Homes Spur Pliolite Paint Sales, Report Says

An increase in the use of Pliolite S-5 by paint manufacturers is following the continuing surge of new homes being built of masonry material, according to a report cited at the recently held first annual sales conference of the Goodyear Tire & Rubber Company's Chemical Division.

More than 50 per cent of the homes started in 1950 were made of masonry material and the percentage has climbed steadily in succeeding years, the report indicated.

Representatives of the Division's sales organization attending the week-long session also heard the latest developments in the chemical industry.

SHARPLES PENT-ACETATE



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AMERICAN CHEMICAL PAINT COMPANY
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: SPECIFICATION RUST PROOFING AND PAINT BONDING CHEMICALS

SPECIFICATION NUMBER	ACP SPECIFICATION CHEMICAL	SPECIFICATION TITLE
QQ-P-416	"LITHOFORM" "ZINODINE"	PLATING, CADMIUM (ELECTRODEPOSITED)
RR-C-82	"LITHOFORM" NO. 32	CANS, CORRUGATED: ASH AND GARBAGE, TAPER-SIDE, ZINC-COATED, WITH COVERS
MIL-C-5541 (See also QPL-5541-1)	"ALODINE"	CHEMICAL FILMS FOR ALUMINUM AND ALUMINUM ALLOYS
MIL-C-16232 Type I Type II	"THERMOIL-GRANODINE" "PERMADINE"	COATINGS — PHOSPHATE; OILED, SLUSHED, OR WAXED (FOR FERROUS METAL SURFACES) AND PHOSPHATE TREATING COMPOUNDS
MIL-E-917A (Ships)	"GRANODINE" "LITHOFORM" "ZINODINE"	EQUIPMENT, ELECTRIC POWER, BASIC REQUIREMENTS FOR (NAVAL SHIPBOARD USE)
MIL-L-3077	"PERMADINE"	LINKS, METALLIC BELT, FOR SMALL ARMS AMMUNITION
MIL-S-5002	"ALODINE" "GRANODINE"	SURFACE TREATMENTS (EXCEPT PRIMING AND PAINTING) FOR METAL AND METAL PARTS IN AIRCRAFT
MIL-V-3329	"GRANODINE"	VEHICLES, COMBAT, SELF-PROPELLED AND TOWED; GENERAL REQUIREMENTS FOR
JAN-C-490, Grade I	"GRANODINE"	CLEANING AND PREPARATION OF FERROUS METAL SURFACES FOR ORGANIC PROTECTIVE COATINGS
JAN-F-495	"GRANODINE" "LITHOFORM"	FINISHES FOR EQUIPMENT HARDWARE
JAN-L-548A	"PERMADINE"	LINK, METALLIC BELT, 20 MM., M8
JAN-T-704	"GRANODINE"	TREATMENT AND PAINTING (FOR CONSTRUCTION AND ENGINEERING EQUIPMENT)
AN-E-19	"ZINODINE"	ELECTRONIC EQUIPMENT; GENERAL SPECIFICATION FOR
AN-F-20 (See also U.S.A. 3-213)	"ALODINE" "GRANODINE" "LITHOFORM" "PERMADINE" "THERMOIL-GRANODINE" "ZINODINE"	FINISHES, FOR ELECTRONIC EQUIPMENT
U.S.A. 57-0-2C Type II, Class A Type II, Class B Type II, Class C	"THERMOIL-GRANODINE" "PERMADINE" "GRANODINE"	FINISHES, PROTECTIVE, FOR IRON AND STEEL PARTS
U.S.A. 51-70-1 Finish 22.02, Class A Finish 22.02, Class B Finish 22.02, Class C	"THERMOIL-GRANODINE" "PERMADINE" "GRANODINE"	PAINTING AND FINISHING OF FIRE CONTROL INSTRUMENTS; GENERAL SPECIFICATION FOR
U.S.A. 50-60-1	"GRANODINE"	CONTAINERS, METAL, FOR ARTILLERY AND ROCKET AMMUNITION
U.S. Navord O. S. 675	"ALODINE"	SPECIFICATIONS FOR THE MANUFACTURE AND INSPECTION OF CARTRIDGE, POWDER, AND ROCKET TANKS (ALUMINUM)
U. S. N. Appendix 6	"LITHOFORM"	INSTRUCTIONS FOR PAINTING GENERAL SPECIFICATIONS FOR BUILDING VESSELS OF THE UNITED STATES NAVY
M-364	"PERMADINE" "THERMOIL-GRANODINE"	NAVY AERONAUTICAL PROCESS SPECIFICATION FOR COMPOUND PHOSPHATE RUST-PROOFING PROCESS
16E4 (Ships)	"ALODINE" "GRANODINE" "ZINODINE"	ELECTRONIC EQUIPMENT, NAVAL SHIP AND SHORE: GENERAL SPECIFICATION
AN-C-170	(See MIL-C-5541)	CHEMICAL FILMS FOR ALUMINUM AND ALUMINUM ALLOYS
U. S. A. 72-53	(See AN-F-20)	FINISHES (FOR GROUND SIGNAL EQUIPMENT)
AXS-1245	(See JAN-C-490)	CLEANING AND PREPARATION OF FERROUS METAL SURFACES FOR ORGANIC PROTECTIVE COATINGS (EXCEPT FIXED INSTALLATIONS)

CHEMICALS ACP PROCESSES

WRITE FOR DESCRIPTIVE FOLDERS ON THE ABOVE CHEMICALS AND FOR INFORMATION ON YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

CALENDAR OF EVENTS

Aug. 20-21. 33rd Annual Convention of American Soybean Ass'n., Jefferson Hotel, St. Louis, Mo.

Sept. 6-11. ACS Fall Meeting, Chicago, Ill.

Sept. 24-25. 20th Annual Convention of the American Tung Oil Ass'n., Buena Vista Hotel, Biloxi, Miss.

Oct. 26-28. 65th Annual Meeting of National Paint, Varnish and Lacquer Ass'n., Chalfonte-Haddon Hall, Atlantic City, N. J.

Oct. 29-31. 31st Annual Meeting of the Federation of Paint and Varnish Production Clubs and 18th Paint Industries' Show, Chalfonte-Haddon Hall, Atlantic City, N. J.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmillers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 2nd Thursday, No Fixed Place.

Detroit, 4th Tuesday, Rackham Building.

Golden Gate, Last Monday, El Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Seven Seas Restaurant.

Kansas City, 2nd Wednesday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, Puritan Hotel, Boston.

New York, 1st Thursday, Building Trades Employers Assn.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings only.

Philadelphia, 3rd Wednesday, Engineer's Club.

Pittsburgh, 1st Monday, Fort Pitt Hotel.

St. Louis, 3rd Tuesday, Forest Park Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Diana Sweets, Ltd.

Western New York, 1st Monday, 40-8 Club, Buffalo.

TECHNICAL Bulletins

FURNACE BLACK

Bulletin on "Witco Continex FEF in Natural and Chemical Rubbers" is available in standard and metric system versions.

Literature covers the properties of Continex FEF, as compared with competitive FEF blacks, in natural rubber, regular GR-S, low-temperature GR-S, Butyl, Hycar, and Neoprene (types GN and W).

Characteristics compared include tensile strength, modulus at 200, 300 and 400 per cent; ultimate elongation; hardness; Shore instantaneous; rebound, Lupke; extrusion rate; mill shrinkage, Mooney plasticity; and Mooney scorch.

For copies of the standard 53-5 or Metric System version 53-6 write to Witco Chemical Company, 260 Madison Ave., New York 16, N.Y.

ALUMINUM PIGMENTS

Eight-page folder on Properties and Uses of Aluminum Pigments and Aluminum Grain has been issued by the Metals Disintegrating Company, Inc., Elizabeth B, N.J., to replace the Metal Pigments Section in the MD Blue Book.

Folder contains specification charts listing properties, uses and performance data of MD aluminum pastes, powders and grains.

MODIFIED POLYSTYRENES

Characteristics and applications of Koppers modified polystyrenes have been described in a 14-page technical bulletin published by the Chemical Division of Koppers Company, Inc.

Seven of Koppers modified polystyrenes, four formulated to provide high elongation and high impact, are described in the publication.

Information on parts manufacture, injection molding, compression molding, extrusion and finishing is presented.

Copies of bulletin C-3-161 will be sent upon request to the firm's Chemical Div., Koppers Building, Pittsburgh 19, Pa.

TITANIUM DIOXIDE

Booklet describes the dispersion of Titanium Dioxide using the intensive mixing procedure.

Chapter headings are: Intensive Mixer Operation, Mechanism of Dough-Mixer Dispersion, Dispersing Vehicle, Selection of the Pigment Type, Operation of the Laboratory Intensive Mixer, and Critical Dispersion Point.

Specification charts augment literature.

Bulletin No. 906 was prepared by the Pigment Department Technical Service, Calco Chemical Div., American Cyanamid Co., Bound Brook, N.J.

SYNTHETIC RESIN COATINGS

Advantages and use of synthetic resin-base coatings in the chemical industry are described in recently published 9-page folder.

The brochure, "Bakelite and Vinylite Resin Coatings for the Chemical Industry," presents 16-case histories of actual industrial coating applications. According to folder, those particular resin-base finishes exhibit excellent resistance to most acids, alkalies, and other chemicals.

Copies of folder may be obtained by writing Bakelite Company, a Div. of Union Carbide and Carbon Corp., 300 Madison Ave., New York 17, N.Y.

Chats about Finishes

NEW LACQUER ADDITIVES RETARD ULTRAVIOLET WOOD DISCOLORATION

by

JAMES R. YEAGER

Manager of Market Development—Coatings Hercules' Cellulose Products Dept.

The increasing popularity of light-colored shades of wood furniture has made the problem of discoloration even more important. Recent investigations have substantiated the generally accepted idea that the major cause of wood darkening is the ultraviolet portion of sunlight. A study was made of many additives to determine which would effectively filter the damaging light rays that cause wood discoloration. The additives were incorporated in heat- and light-stable lacquers.

Of the ultraviolet-light absorbers tested, two materials with a marked degree of effectiveness were found. These materials, when used in colorless lacquers, retard the darkening of many woods. We will be glad to supply you with more complete details on this new lacquer development. Write me or your nearest Cellulose Products sales office.

James R. Yeager

Cellulose Products Department

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MICA IN LATEX PAINTS

Technical Bulletin No. 14, issued by the Wet Ground Mica Association, Inc., 420 Lexington Ave., New York 17, N. Y., is concerned with Studies on the Behavior of Mica as a Pigment Material in Latex Paints. The study deals with (1) the extent of water soluble matter in wet ground mica and in titanium dioxide, and (2) the effect on the pH of two different latices by the addition of various micas and of titanium dioxide during a period of storage for at least two weeks at room temperature. Data and charts resulting from this study are also included.

SYNTHETIC COATINGS FOR PETROLEUM INDUSTRY

The advantages and use of synthetic resin-base coatings in the petroleum industry are described in a new 8-page illustrated folder published by Bakelite Company, a Division of Union Carbide and Carbon Corporation, 30 E. 42nd St., New York 17, N. Y.

Case histories, test results and photographs of actual industrial applications of the finishes are presented in the brochure, "Bakelite and Vinylite Resin Coatings for the Petroleum Industry." These resin-base coatings may be applied by brushing, roller-coating, spraying or dipping, and they dry quickly.

LABELING LAWS

Compilation of Federal and State labeling laws, and regulations covering paint, varnish, putty, linseed oil, naval stores, and other products is provided in a 220 page loose leaf booklet. The Federal Trade Commission's Trade Practice Rules for Masonry Waterproofing Industry and the Putty Manufacturing Industry are also included. Supplements will be issued whenever any laws or regulations are repealed, amended or new ones enacted, and these can be conveniently inserted in the loose leaf style of binding. Copies may be purchased from the National Paint, Varnish and Lacquer Association, 1500 Rhode Island Ave., Washington 5, D.C., at $2.50 each.

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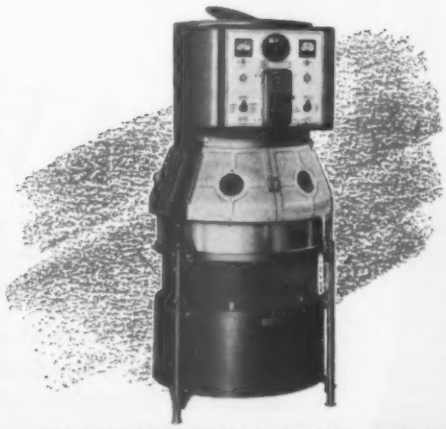

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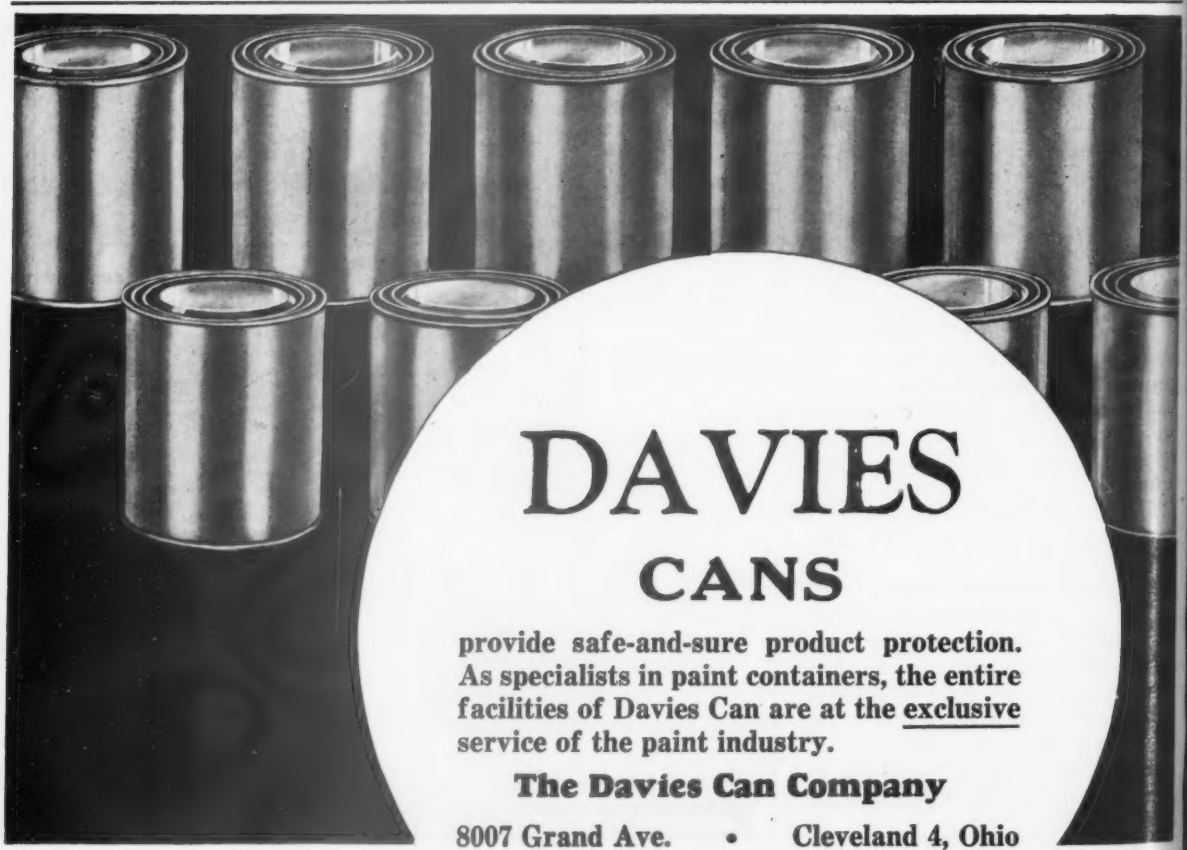

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